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ABSTRACT

This report presents the findings and recommendations from a study of school district and charter school participation in the Texas Virtual School Pilot (VSP). The report also provides an overview of the activities of the charter schools and districts that participated in the first year of the pilot program. This information includes descriptions of methods used to offer electronic courses, information about the students who took these courses, and pilot program costs. The VSP report concludes with recommendations for consideration by the Texas Education Agency and the Texas Legislature, followed by information about a related virtual learning pilot program, "Investigating Quality of Online Courses," and a literature review of the information available on e-learning and virtual schools. Appendices include: profiles of individual VSP participants; VSP data collection instruments; technology requirements for students to access online courses; resources of online course quality guidelines; K-12 Web instructor's certification guidelines; "Technology To Improve Texas Education: Benchmarks and Actions for E-Learning"; additional resources; Web resources on virtual high schools; an example of infrastructure evaluation components for distance learning; Internet-based information technology infrastructure; a selected annotated bibliography; and a report on the state of the nation and the state of the state related to virtual learning. (Contains 61 references, 38 footnotes, and 18 exhibits.) (MES)

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A REPORT TO THE
78TH TEXAS LEGISLATURE
FROM THE TEXAS EDUCATION AGENCY

REPORT ON ELECTRONIC COURSES AND VIRTUAL LEARNING PROGRAMS

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A Report to the 78th Texas Legislature on Electronic Courses and Virtual Learning Programs

Submitted to the Governor,
Lieutenant Governor,
Speaker of the House, and the
78th Texas Legislature

Educational Technology
Texas Education Agency

December 2002

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Felipe T. Alanis
Commissioner of Education

December 1, 2002

The Honorable Bill Ratliff, Lieutenant Governor of Texas
The Honorable Pete Laney, Speaker of the House of Representatives
Members of the 78th
Texas Legislature

The Texas Education Code, Chapter 29, Subchapter Z, Section 29.903, as established by Senate Bill 975, 77th Texas Legislature, 2001, called for the Commissioner of Education to establish a program to examine the state policies, requirements, and restrictions that impact districts offering electronic courses to local students who are not physically present for all or part of these courses. As a result, the Texas Education Agency established the Virtual School Pilot for the 2001-02 school year. The intent of the pilot program was to gather data that would allow the Texas Education Agency to make recommendations that enable quality online learning and to identify mechanisms for state funding of these courses and instructional programs.

The same legislation also mandated a report to address the following issues:

(1) available methods of verifying student attendance;
(2) security or privacy issues involved in providing electronic courses;
(3) educational benefits of electronic courses;
(4) methods for funding electronic courses, including fiscal costs and benefits;
(5) a list of waiver requests submitted to the commissioner; and
(6) a list of provisions waived by the commissioner.

A Study of the Texas Virtual School Pilot (VSP) presents the findings and recommendations from the study of school district and charter school participation in the pilot. The report also provides an overview of the activities of the charter schools and districts that participated in the first year of the pilot program. This information includes descriptions of methods used to offer electronic courses, information about the students who took these courses, and pilot program costs. The VSP report concludes with recommendations for consideration by the Texas Education Agency and the Texas Legislature, followed by information about a related virtual learning pilot program, Investigating Quality of Online Courses, and a literature review of the information available on e-learning and virtual schools.

If you require additional information, please contact the Texas Education Agency staff members or Study Team members listed on the back of the title page.

Respectfully submitted,

Felipe Alanis
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Table of Contents

Executive Summary 1

TEA Recommendations for Electronic Courses and Virtual Learning Programs 5

Section I

A STUDY OF THE TEXAS VIRTUAL SCHOOL PILOT

Introduction 11

Background 11

Legislative Mandate 12

Study Methodology 12

Description of Virtual School Pilot Participants 13

Description of Virtual School Pilot Students 24

Findings from the Study of Electronic Courses and Virtual Learning Programs 25

(1) Verifying Student Attendance for Virtual School Pilot Participants 25

(2) Security and Privacy Issues for Virtual School Pilot Participants 25

(3) Educational Benefits for Virtual School Pilot Students 26

(4) Electronic Course Costs and Funding Alternatives 27

(5) Waivers for Virtual School Pilot Participants 36

Issues and Challenges 37

Key Questions 38

Findings and Recommendations 39

Appendices

A. Profiles of Individual VSP Pilot Participants 89
B. VSP Data Collection Instruments 125
C. Technology Requirements for Students to Access Online Courses 137

Section II

INVESTIGATING QUALITY OF ONLINE COURSES

Investigating Quality of Online Courses Pilot (IQ Pilot) 44

Quality of Service Guidelines for Online Courses 47

Summary and Recommendations 56

Appendices

D. Resources for Online Course Quality Guidelines 141
E. K-12 Web Instructor's Certification 145

Section III

GOING THE DISTANCE: E-LEARNING AND THE TRANSFORMATION OF EDUCATIONAL ENVIRONMENTS

Going the Distance: E-learning and the Transformation of Educational Environments 65

Appendices

F. Technology to Improve Texas Education: Benchmarks and Actions for e-Learning 149
G. Additional Resources 155
H. On Virtual High Schools 161
I. An Example of Infrastructure Evaluation Components for Distance Learning 175
J. Internet-Based Information Technology Infrastructure 181
K. Selected Annotated Bibliography 185

L. *Virtual Learning: The State of the Nation*
Virtual Learning: The State of the State 209

EXECUTIVE SUMMARY

The Commissioner of Education recommends and is prepared to implement the continuation of the Virtual School Pilot (VSP) and the expansion of the Investigating Quality of Online Courses (IQ) Pilot. This recommendation would further refine funding mechanisms for students working independently online to complete a "full load" of courses and would significantly increase opportunities for students interested in taking a limited number of online courses. The VSP and the IQ Pilot have allowed Texas to take important steps forward in its understanding of issues related to electronic courses and its development of recommendations for policies that will enable high-quality online learning. There is significant additional work that must be done before the state can responsibly enact policy changes on a statewide basis that will best serve the children and tax payers of Texas.

The Legislature passed Senate Bill (SB) 975 in 2001 directing the Texas Commissioner of Education to gather needed information on the rapidly expanding world of electronic courses and virtual learning. This legislation called for the commissioner to establish a program to examine the state policies, requirements and restrictions that impact districts and charter schools offering electronic courses to local students who are not physically present for all or part of these courses. In response, two pilot programs were created: the Virtual School Pilot (VSP) and the Investigating Quality of Online Courses (IQ) Pilot. The main purpose of the VSP was to gather data with which to formulate recommendations regarding potential state funding of these courses and policies that will enable high-quality online learning. The main purpose of the IQ Pilot was to develop and pilot quality of service guidelines for online courses to provide assurance to the state, school districts and campuses that courses meeting these guidelines will be of the highest quality in all respects, address student achievement and academic excellence and be aligned with the Texas Essential Knowledge and Skills (TEKS).

Electronic courses and virtual learning offer many potential benefits. Students in small, remote and rural areas of the state may gain access to highly qualified teachers through electronic courses delivered at the school or to another location in the community. Students throughout the state may benefit from availability of advanced courses taught by experts who would not otherwise be accessible. Electronic courses offer opportunities for students to take advanced high school courses. There is a rising need for high-level courses to challenge students and prepare them for college, and electronic courses may be one way to address this need. Students at risk of dropping out of school because of pregnancy, high mobility or disciplinary problems may also benefit from access to electronic courses. In addition, virtual learning programs may provide an additional opportunity for at-risk students who have not been successful in traditional settings.

Virtual School Pilot

According to information gathered from VSP participants and reports and studies in other states, the potential for online courses to benefit students educationally and to improve student performance is promising. During interviews and a forum discussion, VSP participants reported that there were educational benefits for different student populations. One group was full-time students who enrolled in courses for additional credit. The other group was students who were not successful in the traditional school setting. VSP participants felt that electronic courses were meeting the needs of these students when other methods had failed.

To determine if online delivery of courses works educationally, courses need to be defined clearly and reported consistently. There also needs to be a mechanism to track or monitor the programs and student performance to determine their effectiveness. Further study is needed over a longer time period, with a greater number of students and more detailed information, to make a determination about the educational benefits of electronic courses.

Investigating Quality of Online Courses Pilot

Texas, like many other states, has developed rigorous academic content standards defining student expectations and requirements. Until recently, however, no comparable statewide standards existed to address student achievement and academic excellence for Internet-based courses. As the demand for these types of courses rises, Texas educators must provide assurance that online courses being offered are of the highest quality in all respects. Therefore, in parallel with the VSP, the IQ Pilot was established by the Texas Education Agency.

In order to ensure that online courses will be of the highest quality and will be aligned with the TEKS, Quality of Service Guidelines and a checklist that serves as a measurement tool for evaluating courses have been developed by a committee of state and national distance learning experts. Committees of content and online learning experts review each course submitted for consideration.

Summary Conclusions

- There is a growing interest in online electronic courses. Most students who attempt these courses choose to take no more than one or two courses at a time. Many students taking the courses do so at district facilities rather than at home or off-site. Therefore, the perceived need to establish funding mechanisms for students taking a half or full course load online and not at a district facility was not borne out in this study. For most districts a funding mechanism is needed that allows virtual online coursework—for which the student may or may not be physically present—to be combined with non-virtual courses in which students are on a campus.
- There is great interest on the part of students and school districts in having high-quality online courses available and in having mechanisms to allow a student's participation in these courses to be eligible for funding under ADA guidelines. For the most part, such student participation, however, would not contribute even 1/2 ADA because students tend to participate in no more than one or two courses at a time.
  - Methodology piloted to track student time online (VSP Funding Model A) was found not to be a viable method for allowing ADA-based funding due to the nature of online courses and the inability of districts to verify and comprehensively document student time spent in online learning when students are not working at the school site.
  - Methodology piloted to verify student learning (course-completion through VSP Funding Model B), while promising, must be further developed in terms of the quality of the assessments used, documentation of individual student identity and amount of district and Agency resources that would be needed to successfully implement this methodology on a large scale.

Issues Remaining to be Resolved

- This study focused on middle and high school online "courses" and did not evaluate the efficacy of online learning programs for elementary-age students. If independent online electronic options for these students are desirable, additional study should be directed to determine how young children can benefit from such programs. Many elementary students do participate in online learning programs as a part of their normal classroom experience at school district facilities. The study question would involve students who are participating in such online programs while not in attendance at district facilities.
- A major issue raised as a part of the pilot was the potential demand for these independent online courses by students not currently enrolled in the public school system, e.g. "home-schooled" students and students attending private schools. If options for these students who are not currently a part of the public schools are desirable, further study should address the number of additional students potentially to be added to the system and the ability of the state budget to support this additional demand.

Summary Recommendations

- Continue the Virtual School Pilot and give the Texas Education Agency the flexibility to determine appropriate funding mechanisms and student identification and participation controls to allow pilot districts to combine virtual online courses with non-virtual courses to be eligible for up to full ADA funding for enrolled public school students.
  - Determine the district and Agency resources that would be required to support the quality assurance and audit requirements for full-scale statewide implementation.

- Expand and fund the Investigating Quality of Online Courses Pilot, which was designed to review and approve online courses for use by districts.
  - Determine whether there is a need for specific online courses to be developed or licensed for statewide use to ensure that students have greater access to the Recommended High School Program. If so, estimate the costs and other resources needed to make such courses available statewide.
  - Determine the cost to set up a fee-based quality review and approval process for online courses, assessments and student identification procedures, with the expectation that course providers would pay for this.
  - Determine the Agency resources needed to successfully manage large-scale implementation of a state-approval/certification program of online courses that also includes final student assessment and student identification procedures.

- Expand both the Virtual School Pilot and the Investigating Quality of Online Courses Pilot to allow any school district in the state to enroll its students in courses approved under enhanced guidelines to be developed through the expanded IQ Pilot and have such participation be eligible for ADA-based funding up to 100% ADA under the mechanisms to be developed in the continued VSP.

Texas Education Agency Recommendations for Electronic Courses and Virtual Learning Programs

I. **Continue the Virtual School Pilot and give the Texas Education Agency the flexibility to determine appropriate funding mechanisms and student identification and participation controls to allow pilot districts to combine virtual online courses with non-virtual courses to be eligible for up to full ADA funding for enrolled public school students.**

Recommendation 1: Continue the Virtual School Pilot and give the Texas Education Agency the flexibility to determine appropriate funding mechanisms and student identification and participation controls to allow pilot districts to combine virtual online courses with non-virtual courses to be eligible for up to full ADA funding for enrolled public school students. Further study is needed over a longer time period, with a greater number of students and more detailed information, to make a determination about the educational benefits of electronic courses and appropriate funding and accountability structures.

Recommendation 2: Define "electronic course." The definition of "electronic course" recommended as a result of this study includes the following characteristics:

- 80% online–Most instruction is in an online environment, including the regular interaction between student and teacher (via e-mail or chat rooms), monitoring of student activity, and assessment of student performance with the exception of proctored exams. Occasional face-to-face communications are also necessary at the beginning of a course to ensure all students have a solid understanding of the necessary technology and the course requirements. Additional face-to-face communications may also be necessary throughout the course, depending on course content, student progress and the need for exam security. An electronic course should be based on interaction with a teacher via email or other online communication. "Canned" courses without the ability to interact with a qualified instructor may be helpful as supplemental materials but should not be the entire basis for a course.

- Testing course mastery assessment–is crucial to accountability for course credit awards and funding. Proctored administration of an Agency-approved test as a condition of course credit or funding will continue to be required for "course completion" funding in the VSP.

- Not tied to a specific calendar–Start and completion dates are determined as needed by the participating student; however, a maximum course duration is recommended.

- Not tied to a mandated physical location–Students may be physically located in a school, at home, in a library or in any other venue that provides the technology and access necessary to complete the online course.

- Students have access to technical resources–Courses can be accessed and completed with a generally available level of technology.

Recommendation 3: Continue to develop funding models for use in the VSP that work well for districts and the Agency. Determine appropriate funding mechanisms and controls to allow pilot districts to combine virtual online courses with non-virtual courses to be eligible for up to full ADA funding for enrolled public school students.

Recommendation 4: Determine the district and Agency resources that would be required to support the quality assurance and audit requirements for full-scale statewide implementation and develop protocols to monitor electronic courses. Electronic courses can be monitored by the state if districts and charter schools follow reporting guidelines or protocols. Several criteria should be included in these protocols such as enrollment reporting, student performance reporting, attendance records, student completion rates for electronic courses, verification of student attendance, and risk-based monitoring and disproportionality. The Study Team further recommends that participation in the state clearinghouse for virtual programs, the IQ Pilot, be based in part on successful performance as monitored by the state.

Recommendation 5: Cost accounting guidelines for electronic courses and virtual learning should be provided to VSP participants. Rules also need to be developed that prescribe how VSP participants should allocate regular program costs to the electronic courses, where applicable.

Guidelines and rules will increase data consistency and comparability. They will enable districts and charter schools to make timely and accurate reports.

Recommendation 6: Continue to evaluate attendance monitoring and security options. While the purchase and use of biometric devices does not currently make sense for schools and districts offering electronic courses, this arena of technology is quickly advancing. Security options, including those presented by biometric devices, should be explored and evaluated as technological changes occur. This will become especially important if the number of students enrolled in electronic courses continues to expand. Currently, the number of students taking electronic courses has been small enough that more time-intensive methods of verifying identity and ensuring security can be used. However, as student enrollment in electronic courses grows, alternative methods for identity verification will become essential.

Recommendation 7: Explore options for PEIMS reporting of electronic courses. Options for reporting electronic courses through PEIMS should be developed to address the information needs of school districts and TEA.

II. Expand and fund the Investigating Quality of Online Courses Pilot, which was designed to review and approve online courses for use by districts.

Recommendation 8: Expand and fund the IQ Pilot. The IQ Project establishes guidelines for online courses to provide assurance to the state and school districts that courses meeting the guidelines will be of high quality and be aligned with the TEKS. Quality of Service Guidelines and a checklist to serve as a measurement tool for evaluating courses have been developed by a committee of state and national distance-learning experts. Committees of content and online learning experts review each course submitted for consideration. Course providers were invited to participate by submitting courses for review by a committee. Results of the reviews are available through the IQ Pilot at www.iqstandards.info/overview.htm. Next steps should include:

- Review and revise the current recommended standards that serve as guidelines for evaluating quality of service elements for Internet-based courses; include final student assessments and student identification procedures.
- Continue to pilot the use of the guidelines for determining course quality and the evaluation process for efficiency, accuracy and usability.
- Refine the functionality of the online searchable database of courses and automate report generation.
- Develop a procedure to allow course developers to submit courses for re-evaluation, investigate appropriate cost and streamline review procedures for the evaluators.
- Review criteria for evaluator qualifications and develop alternative methods of identifying reviewer candidates to maintain the integrity of the evaluations.
- Develop a program to recruit and train teachers who have an interest in learning the technology skills needed to be effective online teachers.

Recommendation 9: Determine whether there is a need for specific online courses to be developed or licensed for statewide use to ensure that students have greater access to the Recommended High School Program. If so, provide an estimate of the costs and other resources needed to make such courses available statewide and study the possibility of providing needed resources. Options for funding, including grants, should be considered, especially for Recommended High School Program courses for which there are no high-quality online offerings available. These courses can be identified through the IQ Pilot.

Recommendation 10: Determine the cost to set up a fee-based quality review and approval process for online courses, assessments and student identification procedures, with the expectation that course providers would pay for this.

Recommendation 11: Determine the Agency resources needed to successfully manage large-scale implementation of a state-approval/certification program of online courses that also includes final student assessment and student identification procedures.

III. Expand both the Virtual School Pilot and the Investigating Quality of Online Courses Pilot to allow any school district in the state to enroll its students in courses approved under enhanced guidelines to be developed through the expanded IQ pilot and have such participation be eligible for ADA-based funding up to 100% ADA under the mechanisms to be developed in the continued VSP.

Recommendation 12: Expand both the VSP and IQ pilots to allow any school district in the state to enroll its students in courses approved under enhanced guidelines to be developed through the expanded IQ pilot and have such participation be eligible for ADA-based funding up to 100% ADA under the mechanisms to be developed in the continued VSP.

Section I

A STUDY OF THE TEXAS VIRTUAL SCHOOL PILOT

Study of the Texas Virtual School Pilot (VSP)
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Introduction

In 2001, the Texas Legislature directed the Texas Commissioner of Education to gather needed information on the quickly expanding world of electronic courses and virtual learning. In order to gather data to support recommendations that enable high-quality online learning and potential state funding for these courses, the Legislature passed Senate Bill (SB) 975 in 2001. This legislation called for the commissioner to establish a program to examine the state policies, requirements and restrictions that impact districts and charter schools offering electronic courses to local students who are not physically present for all or part of these courses.

To implement SB 975, the Texas Education Agency (TEA) established and administered the Virtual School Pilot (VSP) during the 2001-02 school year. Twenty-four charter schools and school districts participated in this first year pilot. The pilot is continuing during the 2002-03 school year with 23 participants. The same legislation also mandated the commissioner to prepare a report about the program. A study of the VSP was conducted between August 2001 and November 2002 to gather data and prepare this report. Legislation requires the report to address the following issues:

1. Available methods of verifying student attendance
2. Security or privacy issues involved in providing electronic courses
3. Educational benefits of electronic courses
4. Methods for funding electronic courses, including fiscal costs and benefits
5. A list of waiver requests submitted to the commissioner and
6. A list of provisions waived by the commissioner

This report provides an overview of the activities of the school districts and charter schools that participated in the first year of the pilot program. This information includes descriptions of methods used to offer electronic courses, information about the students who took these courses and pilot program costs. Findings from the study and recommendations for the future are also detailed.

Background

Over the past ten years, electronic or virtual courses have become a subject of great interest to educators and people concerned about education. According to SB 975, "electronic course" means an educational program or course available primarily through the Internet-or other electronic media and in which a student enrolled in the course is not physically present in the classroom for all or part of the course.

The interest in electronic courses reached a new level in 1996, when the Florida Virtual School began as a partnership between two Florida counties. The next year, the Florida Department of Education, with funding from the Florida Legislature, officially opened the statewide Florida Virtual School for the purpose of creating online high school curricula. Several other states, including Alabama, Kentucky, Nebraska and New Mexico, followed suit.

At the same time, several reports regarding the possibilities of electronic courses were released, thus sparking even more interest in this method of serving students. In December 2000, the Web-Based Education Commission released its report, *The Power of the Internet for Learning: Moving from Promise to Practice*, to the President and the Congress of the United States.[1] This report provided a comprehensive discussion of electronic educational efforts, from pre-kindergarten through postsecondary levels and corporate training. It also called for Congress and the President of the United States to support the efforts to remove existing barriers to virtual learning and to develop new models for education that harnesses the power of the Internet.

Against this national backdrop, educators and policymakers in Texas were holding conversations regarding electronic courses. By fall 2000, several Texas school districts, such as Northside Independent School District (ISD), Plano ISD and Houston

[1] *The Power of the Internet for Learning: Moving from Promise to Practice*. Report of the Web-Based Commission to the President and Congress of the United States. Senator Bob Kerrey, Chair. Washington, DC, December 2000.

ISD, were offering Web-based courses to their students. Commercial providers of virtual courses were offering courses to Texas regional clearinghouses and to individual districts for a fee.

The Texas Legislature required implementation of a program to permit students to enroll in electronic courses and, in some cases, qualify for state aid. It also required a study of the pilot program and an update of *Virtual Learning: The State of the Nation and the State of the State*[2]—an overview of national and statewide virtual programs. TEA contracted with a Study Team, to gather information from VSP participants, prepare a report, and update and expand the information covered in *Virtual Learning: The State of the Nation and the State of the State*. The completed update, entitled *Going the Distance: e-Learning and the Transformation of Educational Environments*, presents an overview of the current literature and provides a comprehensive series of resources for policymakers regarding e-learning research, issues with virtual schools and policies that have been enacted across the country to address these issues. A full account of these changes and new research can be found in *Going the Distance: e-Learning and the Transformation of Educational Environments*, included in Section III of this report.

Legislative Mandate

During the 77th Texas Legislature, SB 975 (2001) was passed, establishing Texas Education Code, Chapter 29, Subchapter Z, Section 29.903. This legislation called for the Commissioner of Education to create a program to examine state policies, requirements and restrictions impacting districts that offered electronic courses to local students who are not physically present for all or part of these courses. The purpose of the pilot program was to gather data for a report covering the following six issues:

1. Available methods of verifying student attendance
2. Security or privacy issues involved in providing electronic courses
3. Educational benefits of electronic courses
4. Methods for funding electronic courses, including fiscal costs and benefits
5. A list of waiver requests submitted to the commissioner; and
6. A list of provisions waived by the commissioner

Study Methodology

The Study Team initiated a 16-month study of electronic courses and virtual learning programs in school districts and charter schools in Texas.[3] While no additional funding was provided for the pilot program participants, funding restrictions based upon average daily attendance (ADA) could be waived by TEA to allow participants to receive up to full Foundation School Program (FSP) funding based on ADA for students who took one or more electronic courses.[4]

In the 2001-02 school year, TEA selected 24 sites for participation in the first year of the VSP. The pilot participants were informed of the study component of the VSP as a condition of participation. They agreed to comply with data collection activities so that TEA could learn about their endeavors in online learning as well as issues regarding attendance, security, waivers and the funding of electronic courses. Information was to be collected throughout the VSP and the concomitant study to allow the six issues outlined in SB 975 to be addressed:

Study Team members gathered information for the study from both fall 2001 pilot programs and spring 2002 pilot programs using survey instruments, telephone interviews and site visits. The survey instruments, developed in collaboration with staff at TEA, covered seven separate subject areas, including (1) Finance issues, (2) General issues, (3) General student data, (4) Individual student data, (5) Program descriptions, (6) Staffing issues, and (7) Technology issues. The instruments are included as Appendix B. The Study Team piloted the surveys in fall 2001 at one school district and then distributed them to the entire fall 2001 group. Minor revisions were made to the surveys to reflect changes in the application process, and the Study Team distributed surveys to the entire spring 2002 group.

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[2] *Virtual Learning: The State of the Nation and the State of the State*, Second Edition. Prepared by Gloria McClanahan of the Educational Technology Division, Texas Education Agency. Austin, TX, January 2001.

[3] Districts and charter schools that wished to share service arrangements were also eligible to participate.

[4] Under the guidelines set forth in SB 975, students did not have to be physically present for all or part of these courses.

Follow-up telephone interviews further explored survey responses and gathered additional information from the participants on an as-needed basis. School and district administrators responsible for the management and supervision of the electronic courses participated in interviews.

The Study Team then conducted site visits at seven separate sites, including financially focused site visits at three of these sites. The Study Team selected sites to represent the range of schools and districts participating in the VSP. Issues that were taken into consideration during site selection included responsiveness to surveys, charter school or traditional school status, geographic location of the site, number of courses offered, delivery method of courses and number of students served. The Study Team provided the sites with a protocol for the on-site interviews before the visit. Teams of one to four members of the Study Team visited the sites. Team members conducted in-person interviews with school and district administrators and examined a sample of the electronic courses offered at that site.

The Study Team also gathered information through a forum of school and district administrators involved in the VSP. The Study Team invited all VSP participants to attend the forum. Twenty-three individuals representing 13 sites participated in the forum, which was held on June 13, 2002. The represented sites included individual school districts, consortia of school districts and individual charter schools. The forum provided an opportunity for pilot participants to share their experiences with TEA and the Study Team, as well as to learn from the work of other pilot participants. The attending individuals discussed their programs, specific areas of interest, finance and attendance issues and program challenges. TEA staff members also requested feedback from the participants on the 2001-02 pilot program and suggestions for the future.

Description of Virtual School Pilot Participants

To participate in the VSP, schools and districts had to submit a Statement of Interest to TEA and be selected for participation. Ten applicants completed Statements by the fall 2001 deadline and were accepted into the VSP. Fourteen applications were submitted by the spring 2002 deadline, and all were accepted. The Statement of Interest was to include a description of the proposed electronic course(s) and their proposed method of delivery, a description of proposed assessments, requests for waivers, and selection of one of three possible funding models.

Four school districts and nine charter schools requested waivers to allow the district or school to alter the method of computation for daily attendance that currently appears in statute. TEA granted all 13 waivers. Charter schools submitted numerous requests for enrollment cap increases and expansion of their boundaries. TEA submitted these requests to the Charter Schools Division to be considered as charter amendments rather than waivers from current law and rule.

A total of 24 sites were selected by TEA for participation in the 2001-02 VSP. The participants consisted of 12 independent school districts (ISDs), nine charter schools, and three consortia of school districts, one consisting of three ISDs, one of 17 ISDs, and a consortium of three charter schools. The participants comprised two groups, one group of ten (eight school districts and two charter schools) beginning the pilot in fall 2001 and the other of 14 participants (four school districts, seven charter schools and three consortia) beginning in spring 2002. One consortium of charter schools dropped out of the VSP as did one individual charter school. A list of the 24 selected sites and their characteristics appears in **Exhibit 1**.

Exhibit 1
Fall 2001 and Spring 2002 Participants

Site Name	Site Type		
	District or Charter School Size	District or Charter School Location	Consortium
Fall 2001 Group			
Allen Independent School District	10,600	suburban	
Birdville Independent School District	21,245	suburban	
Duncanville Independent School District	10,420	suburban	
Houston Independent School District	208,400	urban	
Northside Independent School District	63,739	urban	
Plano Independent School District	47,161	suburban	
Rankin Independent School District	286	rural	
Southwest Preparatory Charter School	231	urban	
Spring Branch Independent School District	31,659	urban	
University Charter School Online Campus	169	*	
Spring 2002 Group			
Amarillo Independent School District	28,908	urban	
Austin Independent School District	77,816	urban	
Brazos School for Inquiry and Creativity Charter School	86	central city	
Calvin Nelms Charter High School	168	urban	
Clear Creek Independent School District	29,875	suburban	
Harris County Department of Education Consortium	107,796	urban	3 districts
Katherine Anne Porter Charter School	114	small town	
Magnolia Independent School District	7,065	suburban	
Panola Charter School Consortium **	90	small town	3 charters
Ranch Academy Charter School	40	rural	
San Antonio School for Inquiry and Creativity Charter School	21	urban	
Star Charter School	140	rural	
SUPERNet Consortium	48,139	rural	17 districts
RaulYzaguirre School for Success **	621	urban	

Sources: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys.

** Note: University Charter School Online Campus draws students from around the state.*

*** Note: Raul Yzaguirre School for Success Charter School and the consortium led by Panola Charter School withdrew from the VSP.*

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Overview of Data Collection

Thirteen sites, or half of the VSP participants, completed surveys and submitted them to the Study Team. Houston ISD administered two separate virtual programs and completed a survey for each program for a total of 14 completed surveys. The information detailed throughout the report is based in part on the 14 surveys received from the 13 sites.

There were low response rates from many participants in the VSP. Some participants had difficulty compiling the required information because they were not prepared for the amount of documentation required as part of the pilot program, did not assign staff to gather the information and had difficulty compiling the required information. As a result, they did not submit data. Other reasons for no response include withdrawal from the pilot and cancellation of participation for a semester because of low student enrollment. Sites that did not provide completed surveys were contacted numerous times to encourage the return of information.

Members of the Study Team also visited seven of these 12 sites, including four sites in the fall 2001 group and three in the spring 2002 group. **Exhibit 2** displays the sites that participated in these data collection efforts and shows the sites that responded to surveys and the sites that the Study Team visited.

Exhibit 2
Data Collected from VSP Participants

Site Name	Data Collected	
	Surveys	Site Visit
Fall 2001 Group		
Allen Independent School District	X	
Birdville Independent School District	X	
Duncanville Independent School District	X	
Houston Independent School District	XX (completed surveys for 2 programs)	X
Plano Independent School District	X	X
Southwest Preparatory Charter School	X	X
University Charter School Online Campus	X	X
Spring 2002 Group		
Amarillo Independent School District	X	
Austin Independent School District	X	
Harris County Department of Education Consortium	X	X
Katherine Anne Porter Charter School	X	X
Magnolia Independent School District	X	
SUPERNet Consortium	X	X
Total by Category	**14 surveys**	**7 site visits**

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys and site visits

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Data Findings

Study Team members found that pilot participants had diverse understandings of the terms "electronic courses" and "virtual learning." These terms were used to describe very different delivery and instructional methods in the online environment. While Texas schools have offered distance learning and technology-enhanced courses for a number of years, most of those courses do not fit the definition of electronic courses used in this pilot. The term "electronic courses" describes courses or programs of study in which students receive part or all of their instruction in an online environment. Under this definition, the student does not have to be physically present at the school facility for all or part of the course. A student enrolled in a virtual course may be physically located in a school, at home, in a library, or in any other location that provides the student access to the online course. A student taking an electronic course should be under the supervision of a teacher, either at the student's school or a remote site. All of the pilot participants met TEA's definition of "electronic courses." Electronic course offerings ranged from programs delivered completely on line by instructional staff members who never met face-to-face with students, to electronic courses delivered at school sites during the regular school program day, to online courses taken at home but supported by direct contact with a teacher.

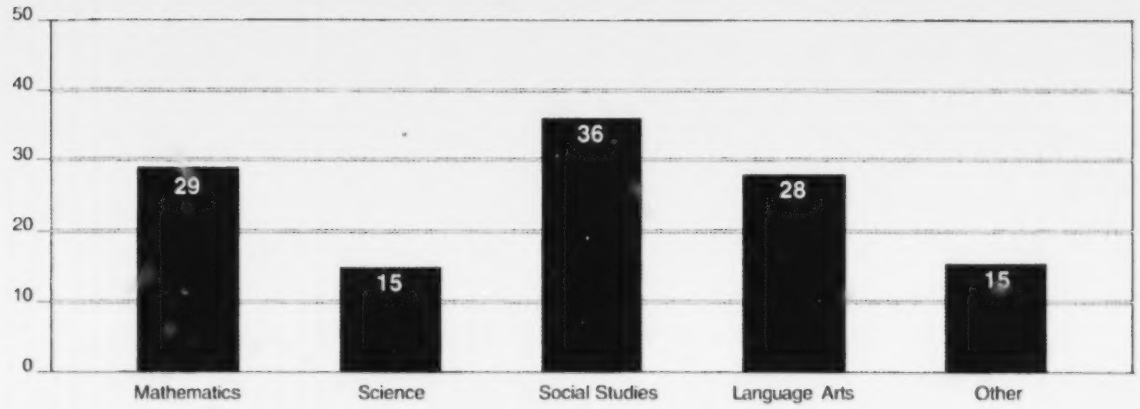
The Agency required access to online courses regardless of a student's personal access to a computer and the Internet. The participating sites offered electronic courses for students through a variety of methods. Some had computers at the school that students used. Others offered students the opportunity to access online courses from home or other non-school location that had an Internet connection. A few sites loaned computers to students. Methods to provide instructional support varied as well with a few VSP participants offering no support from teachers at the school to one site providing each student with two hours per week of direct, one-on-one instruction.

VSP participants served students in sixth grade through twelfth grade. The number of students served ranged from two in Magnolia ISD in fall 2001 to more than 440 in Houston ISD in Summer 2002. All of the pilot programs, with the exception of the Houston ISD Middle School Program, focused on high school students. The majority of independent school district pilots (nine out of the 12 participating districts) and one of the charter school pilots focused their offerings on students who were enrolled full-time in the district or charter.

VSP participants offered 357 courses to nearly 2,200 students during the pilot year.[5] The majority of course offerings focused on core subject areas of mathematics, science, social studies, and English language arts. About 12% of courses were in other subjects. **Exhibit 3** lists the number of courses offered in each subject area.

[5] Course and student counts may be duplicated. Survey participants reported the number of courses and the number of students served each semester. Most participants did not turn in class rosters.

Exhibit 3
Virtual Course Offerings by Subject Area



Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

To illustrate some of the ways in which pilot participants used the online environment to serve students, examples of the types of courses offered in each subject area are listed below:

- Mathematics courses: Algebra, Geometry, Pre-Calculus, AP Calculus, Math Models, and Statistics
- Science courses: Chemistry (both regular and AP), Physics (both regular and AP), Aquatic Science, Biology, and Oceanography
- Social Science courses: Economics, Health, U.S. History, World History, U.S. Government, Psychology, and Sociology
- Language Arts courses: English I-IV, Advanced Composition, Reading Skills, and AP English Literature and Composition; and
- "Other" courses: Latin, Spanish I-III, BCIS, Marketing, Study Skills, Career Studies, International Business, and Introduction to Business

The rationale behind the decision to offer courses electronically varied. To better understand why a school or district would choose this approach, several of the survey questions were designed to ascertain the reasoning behind the decision to become involved in virtual learning. Similar responses were grouped into five descriptive categories. **Exhibit 4** reflects the categories of the pilots' responses and the number of responses per category. Most of the pilots indicated multiple goals for offering electronic courses, with the most common goal being flexibility in scheduling and the ability to offer additional courses for students.

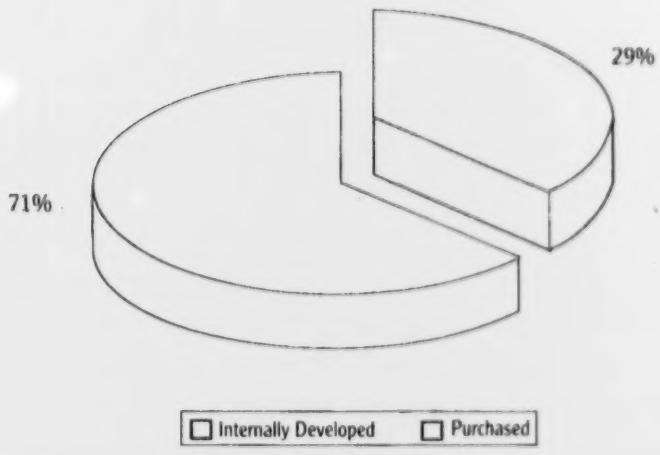
Exhibit 4
Rationale Behind Choice to Offer Electronic Courses

Survey Question	Number of Responses to Survey Questions				
	Flexibility in Scheduling	Ability to Offer Additional Courses	Accelerated Credit Accumulation	Credit Recovery	Other
Why did the district or charter school decide to offer electronic courses at this time?	4	6	3	2	4
What were the advantages of electronic courses for the school?	5	4			11*
What were the advantages of electronic courses for students and families?	8	8	3	4	4

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys
**Note: Three responses indicated that more courses could be offered with fewer teachers.*

Only four of the pilot sites developed their courses in-house. The remaining sites purchased courses from third-party vendors, but often tailored the courses or the manner of implementation to their own unique circumstances. VSP participants used a variety of third-party vendors, including for-profit companies, other Texas school districts, virtual schools in other states, and courses offered by higher education institutions and ESCs. **Exhibit 5** shows the percentages of participants who developed courses internally and those who purchased already developed courses. Even within the "build-your-own" approach, there was a great deal of variety. Both Houston ISD and Plano ISD developed several electronic courses internally, using significant amounts of resources to do so. In contrast, the University Charter School developed over 40 courses in a little over a year by modifying their existing distance learning courses (available primarily as correspondence courses or CD-ROM course materials) to an online platform. The Katherine Anne Porter Charter School took a different tack and started with relatively simple courses that consisted primarily of course outlines and assignment schedules for senior students who wanted additional learning opportunities. It is interesting to note that two of the pilot sites used the Florida Virtual School model as a foundation for their own programs.

Exhibit 5
Source of Electronic Courses



Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

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To show the number of courses offered by the pilot participants and the number of students served in the VSP, **Exhibit 6** lists sites that reported data, a description of the service delivery method used, the number of courses offered in fall 2001 and spring 2002 and/or summer 2002, and the number of students enrolled in these courses. It is important to note that most of these programs began very recently and were in the process of gearing their programs up during the 2001-02 school year. For this reason, many programs reached small numbers of students. Appendix A provides profiles of the programs offered by the districts and charter schools listed in Exhibit 6.

Exhibit 6
Course and Enrollment Information by Site

Site Name	Service Delivery Method and Students Served	Number of Courses Offered		Number of Students Enrolled	
		Fall 2001	Spring/ Summer 2002	Fall 2001	Spring/ Summer 2002
Allen ISD	Purchased courses from Concord Consortium's Virtual High School.[6] Courses offered to regular AISD high school students during a scheduled period during the day. However, students could also access programs at any time.	15	Spring-17	13	Spring-15
Amarillo ISD	Purchased courses from vendor. Students completed work outside of regular school classes.	Not in Fall Pilot	Summer-2		Summer-44
Austin ISD	Purchased curriculum and record system. Courses for teen parents and recovered or potential dropouts. Teachers met twice a week with students in their homes or at a community center.	Not in Fall Pilot	Summer-13		Summer-20
Birdville ISD	Purchased courses from the Florida Virtual School.	5	Spring–6 Summer-4	11	Spring - 23 Summer - 29
Duncanville ISD	Purchased courses from Class.com. Courses offered to all students without regard to residency.	2	Spring-4 Summer-4	0	Spring -12 Summer-8
Harris County Department of Education Consortium	Purchased curriculum using Plato Learning. Courses aimed at credit recovery and at-risk students.	Not in Fall Pilot	Spring-2 Summer-2		Spring - 15 Summer - 23
Houston ISD	Purchased Advanced Placement courses. Courses offered to above average students in several disciplines.	17	Spring–17 Summer-17	175	Spring -185 Summer-25
Houston ISD Middle School Program	Middle School courses developed internally. Most students were full-time middle school students. Used mostly to supplement materials in regular classrooms.	4	Spring- 4 Summer-12	400	Spring-440 Summer-60

[6] For more information on this program, see Section III *Going the Distance: e-Learning and the Transformation of Educational Environments*, or see http://www.govhs.org/website.nsf.20

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Site Name	Service Delivery Method and Students Served	Number of Courses Offered		Number of Students Enrolled	
		Fall 2001	Spring/ Summer 2002	Fall 2001	Spring/ Summer 2002
Katherine Anne Porter Charter School	Courses developed internally upon demand. Courses aimed at full-time students, mostly seniors, who take electronic course as an additional course. Courses consisted primarily of a course outline offered electronically.	Not in Fall Pilot	Spring-12 Summer-8		Spring-9 Summer-10
Magnolia ISD	Courses purchased from Texas Virtual School, a Web-based initiative sponsored by regional service centers. This nonprofit organization uses courseware from Class.com and APEX. Courses aimed at full-time students who want additional courses.	3	Spring-3 Summer-3	2	Spring-7 Summer-6
Plano ISD	Plano's eSchool has developed its own courses internally to supplement district course offerings. Courses aimed at full-time students wanting additional credit.	28	Spring-30	NA**	Spring-407
Southwest Preparatory Charter School	Southwest Preparatory purchased courses using Plato Learning online programs. Program began in December 2001 and targeted at-risk students.	18	Spring-4 Summer-12	6	Spring-56 Summer-21
SUPERNet Consortium	Course purchased from the Florida Virtual School. Program began in the Summer 2002 with one course offering (Geometry). Enrolled students came from ten different districts. The consortium has been selected by Microsoft as one of ten regional centers around the country to test and implement Microsoft Class, a tool that will allow the consortium to develop and modify online courses rapidly and at a reasonable cost.	Not in Fall Pilot	Summer-1		Summer-37
University Charter School Online Campus	Courses developed by adopting high school correspondence courses already in place to an online platform. Courses aimed at students across the state who are unable to attend classes in a traditional setting.	44	Spring-44	148	Spring-45
TOTAL		**136**	**221**	**755**	**1,497**

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

NI= no information provided.

* Note: Program began in summer 2002.

**Students enrolled in Plano ISD electronic courses in fall 2001 were not part of the VSP.

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A number of the pilot programs reported that students had not completed their course work by summer 2002. For example, Plano ISD operates its program on a continuous enrollment basis. Students have six to 18 weeks to complete the course, based upon the individual course. From August 2001 to August 12, 2002, the VSP enrolled 407 students in 30 courses. Of these students, 157 completed course work and 33 cancelled or were dropped from the rolls. The remaining students are expected to complete their course work during fall 2002. Southwest Preparatory Academy began its virtual program in December 2001 and had 56 students enrolled in spring 2002 and 21 students enrolled in summer 2002. Nine students completed course work each semester and many of the remaining students are expected to finish in fall 2002.

Other programs have just begun initial operations so it is impossible to draw conclusions from them at this time. For example, the SUPERNet Consortium offered Algebra I to 37 students during summer 2002. Thirty students, or 82%, completed the course. Amarillo ISD began its program in summer 2002 and offered two courses to 44 students. Thirty-five of these students completed the course. Other programs such as Allen ISD, Austin ISD, Birdville ISD, Duncanville ISD, Magnolia ISD and Harris County Department of Education Consortium have fewer than 30 students enrolled in their programs. In addition, a number of VSP participants did not provide any information about course completion.

As can be seen in the description of the service delivery methods used, VSP participants used a variety of approaches to develop and deliver their online courses. Some developed electronic courses through collaboration with other districts. Allen ISD participated in the Virtual High School, [7] a nonprofit collaborative of high schools from across the nation.

The SUPERNet Consortium used a formal partnership with 17 school districts in east Texas to provide technology assistance as well as electronic courses to their largely rural populations. Austin ISD informally shared courses with other districts outside of the pilot, such as Alief ISD.

The delivery methods for online instruction varied as widely as the development of the electronic courses. Course delivery ranged from teachers in regular classrooms using electronic courses as supplements to approaches where students completed electronic courses independently outside of school. One district, Austin ISD, combined independent study with twice-weekly visits by teachers to students in their homes or local community centers.

Pilot participants also used multiple methods to promote student and parent interest in the offered electronic courses. Pilot participants were asked to respond to the survey question: "*How did you promote interest in electronic courses? Specifically, how were parents and students notified of these courses?*" Similar survey responses were grouped into categories. The major categories are shown in **Exhibit 7**. Many of the participants used multiple methods to spark the interest of students and their parents. Most sites reported interest increasing as students began working with the electronic courses and sharing their experiences with other students.

Exhibit 7
Methods Used by VSP Participants
to Promote Interest in Electronic Courses

Methods used to promote interest in and notify students and parents of electronic courses	# of Responses	Percentage of Total Survey Respondents
Fliers/Brochures	8	57.1%
Television	6	42.9%
Web site	6	42.9%
School Newsletters/Announcements	6	42.9%
Newspaper	4	28.6%
Counselor/Teacher Recruitment	3	21.4%
Program Demonstrations	2	14.3%

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

[7] For more information on this program, see http://www.govhs.org/website.nsf.

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To further explore the instructional approaches used by the VSP participants, Study Team members asked the pilots how virtual students communicated with instructors. **Exhibit 8** lists their responses to this inquiry. Many pilot sites used multiple methods of communication. The most common methods used included face-to-face discussions with teachers and e-mail. The Austin ISD program, which focused on teen parents and recovered or potential dropouts, had the most extensive face-to-face communication efforts.

Several of the pilots mentioned that their use of e-mail for teacher-student and student-student interaction proved to have unexpected benefits, noting that using e-mail as a key method of communication helped students improve their writing skills. Variations within each method of communication were also seen. For example, the Southwest Preparatory Charter School sent parents copies of each e-mail, thus using e-mail both to communicate with students and to involve parents.

Exhibit 8
Methods of Communication
Between Students and Instructors

Methods used to promote interest in and notify students and parents of electronic courses	# of Responses	Percentage of Total Survey Respondents
E-mail	12	85.7%
Face-to-face Discussions	9	64.3%
Telephone	9	64.3%
U.S. Mail	3	21.4%
Other (such as chat rooms, instant messaging, or threaded discussions)	3	21.4%

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

Exhibit 9 breaks out the percentage of time spent on each of the different communication methods at individual pilot sites. E-mail was used by all of the responding pilot participants. Some sites relied heavily on e-mail while those that offered most of their instruction on school property during the school day relied instead on face-to-face contact with teachers. One site permitted students to complete online coursework at home at any time and provided home visits by teachers.

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Exhibit 9
Percentage of Communication Time Spent By Communication Method

Survey Question: Characterize the ways that students and instructors communicated with an approximate percentage for each.	E-Mail	Face to Face	Telephone	U.S. Mail	Other
Allen ISD	1%		1%		98% (private thread within course)
Austin ISD	Works one-on-one with student twice a week				
Birdville ISD	80%	5%	10%		5% (chat room)
Duncanville ISD	75%	5%	20%		
Harris County Department of Education Consortium	25%	75%			
Houston ISD High School (online courses)	94%	1%		5%	
Houston ISD High School (on-site teaching)	2%	96%	1%	1%	
Houston ISD Virtual Middle School (online teachers)	95%	1%	2.5%	1.5%	
Houston ISD Virtual Middle School (on-site teachers)	3%	96%	1%		
Katherine Anne Porter Charter School	50%	50%			
Magnolia ISD	90%		10%		
Plano ISD	100%				
Southwest Preparatory Charter School	70%	20%	10%		
SUPERNet Consortium	18%	1%	40%		41% (chat rooms and instant messaging)
University Charter School Online Campus	Most interactions by phone or e-mail				

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

Somewhat surprisingly, most pilots reported that the students taking electronic courses already had access to the technology needed for the course, either at school or at home. Only the Harris County Department of Education Consortium and the University Charter School indicated concerns regarding technology access for their students. A number of pilot participants, such as Amarillo ISD and Southwest Preparatory Charter School, were prepared to loan equipment if needed, but there was little reported need during the pilot year. Austin ISD provides laptop computers and home Internet connections to their students (who are pregnant and parenting students) using donations from education business partners. Appendix C describes the technology required for students to access online courses at each pilot site.

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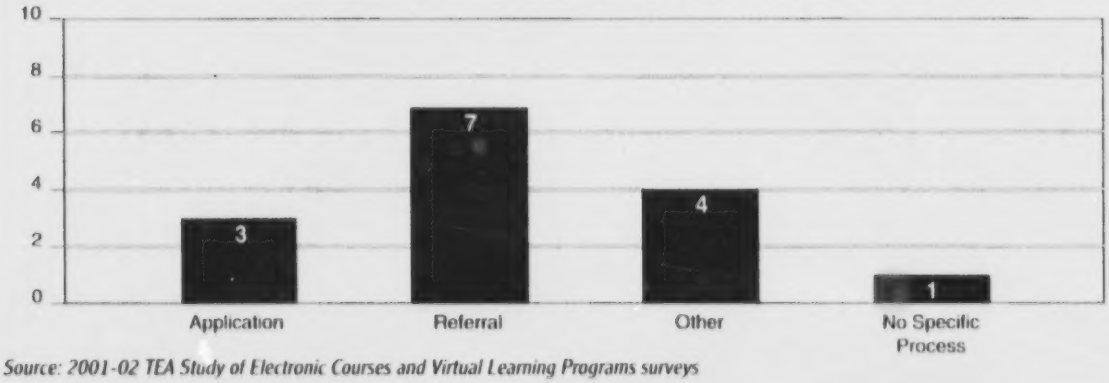
Description of Virtual School Pilot Students

Exhibit 10 illustrates how students were selected for inclusion in the electronic courses. A number of the pilot programs used a self-assessment tool that helped interested students decide for themselves if they were prepared for the independent study required by these courses. Most pilot programs were open to enrollment by all students. As one example, the SUPERNet Consortium allowed students to try the course for a two-week period to see if they liked the online approach to learning before committing to the course.

Exhibit 10
How Schools Selected Students for Virtual Programs



Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

There was substantial agreement among the pilot participants regarding the characteristics of students who are successful and unsuccessful in electronic courses. **Exhibit 11** describes the characteristics attributed by the pilots to successful and unsuccessful students. Most, if not all, of these characteristics would remain the same for students in a traditional setting as well. However, because most of the pilot participants are in the initial stages of development of their online course programs, it is impossible at this time to draw firm conclusions about the type of student who will succeed in these courses.

VSP participants indicated that keeping students engaged in a course through attendance requirements and frequent interaction via e-mail helped ensure success. One pilot, the University Charter School, indicated a concern that the requirement of enrollment in five courses to qualify for full-time enrollment (and funding) may have contributed to many students' lack of success. They believed that most students were simply overwhelmed by the accompanying workload.

Exhibit 11
Characteristics of Successful and Unsuccessful Students

Characteristics	# of Responses	Percentage of Total Survey Respondents*
Students Likely to Succeed in Virtual Courses		
Self-directed and disciplined	10	71.4%
Organized	7	50.0%
Other (independent learners, overachievers, exceptional communication skills)	6	42.9%
Technologically sophisticated	5	35.7%
Students Likely to Fail Virtual Courses		
Not self-directed, lack discipline	14	100.0%
Disorganized	10	71.4%
Limited technology skills	4	28.6%
Need social interaction	2	14.3%

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

** Note: Percentages will not add to 100 because there were multiple responses to the question.*

Findings from the Study of Electronic Courses and Virtual Learning Programs

The findings of the VSP are discussed in the following five sections: (1) Verifying student attendance for VSP participants; (2) Security and privacy issues for VSP participants; (3) Educational benefits for VPS students, (4) Electronic course costs and funding models; and (5) Waivers for VSP participants.

(1) Verifying Student Attendance for Virtual School Pilot Participants

Pilot sites provided information to the Study Team regarding monitoring of attendance in electronic courses offered in schools and other locations. Some participants measured attendance at the school because students used school computer labs for most of their course work. Some districts used teachers or other staff members to measure login time as a method of monitoring attendance. In many cases, the instructional software included a time and topic tracking system that teachers could check to verify attendance. During the forum discussion, it was noted that login time is subject to over counting when the computer remains on but students are engaged in other work or family activities. Under counting can also occur because login time fails to account for reading related materials, preparing projects and other activities that do not require a computer. This may make contact time (which can be documented as login time) an inappropriate funding model.

Eleven VSP participants relied on end-of-course tests to determine if the student had mastered the course content. The terms and conditions of the VSP required that these tests be proctored. Districts and charter schools that selected the course-completion funding model did not need to monitor daily attendance, but they reported that they did verify that students gaining credit for the courses were the ones taking the final examination. For example, exam proctors used picture identification cards to ensure that the student enrolled in the course was the student taking the examination. **Exhibit 12** lists the different methods VSP participants used to verify attendance in electronic courses. Not all VSP participants provided information about attendance verification, and no participant reported problems verifying attendance.

Exhibit 12
Attendance Verification

Methods to verify attendance/coursework	# of Responses	Percentage of Total Survey Respondents
Courseware program has tracking feature or through course login	8	57.1%
Course completion	2	14.3%
Other (weekly log, lab manager takes roll)	2	14.3%
Teacher monitoring	1	7.1%

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys

None of the VSP participants used biometric methods to authenticate student attendance, nor did they indicate a need to use such methods at this point. In fact, several pilot participants had researched the issue and decided not to invest in biometric methods because they perceived that biometric technology was not yet effective enough to justify its current purchase cost.

(2) Security and Privacy Issues for Virtual School Pilot Participants

The use of computers and the Internet to deliver course content can raise concerns for the security of transmitted information and the privacy of the participating students and teachers. VSP participants were asked about their experiences and efforts to avoid problems with these issues.

VSP participants expressed concern that students using Internet communication would be the targets of offensive electronic advertising or promotions. For this reason, some participants required students to use school Internet connections because the school district had implemented protections against unwanted e-mail. Several forum participants noted that intrusion of unwanted e-mail is not confined to students taking electronic courses, but is instead a systemic problem. Other VSP

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participants said that security and privacy were not currently a problem. One VSP participant that also develops and sells courses expressed concern about unauthorized use of courseware by hackers or by people not authorized to share the materials, but added that such concerns were not related to VSP participation.

(3) Educational Benefits for Virtual School Pilot Students

The Study Team was unable to determine unique educational benefits of electronic courses. The primary reason for the failure to draw conclusions on this issue is the absence of sufficient information from VSP participants. The Study Team requested but did not receive adequate information on course completion or course performance of students. Profiles that appear in Appendix A display data that were received.

Some anecdotal information was provided during interviews and the VSP participant forum meeting, however. For example, VSP participant staff members and administrators frequently noted that electronic courses have benefits for certain types of learners. Learners motivated to advance more quickly through the curriculum or to take more courses than can be conveniently scheduled during the school day are good candidates for electronic courses. Students who have good organizational skills and who work well independently and enjoy a degree of independence from teachers and traditional methods of instruction are more likely to be successful in electronic courses, according to educators. Students who are not "self starters," who lack intrinsic motivation to undertake new learning, and who lack organizational skills have the most difficulty with electronic courses and are most likely to abandon the courses before completing them. (This information also appears in Exhibit 11.)

Some VSP participants offered online instructional opportunities to students at risk of not graduating. For example, Harris County's program was targeted to high-risk students. It served 15 students in Spring 2002 and 23 in Summer 2002, with about two thirds completing one of the two courses offered. Austin ISD's DELTA Program assisted potential dropouts in attaining credit toward graduation. The Austin VSP model called for frequent and sustained teacher contact with students to assure success. Southwest Preparatory Academy targeted its program to nontraditional students, and the program director noted that pregnant students and students with medical conditions were able to benefit from the program. During the VSP forum participant discussion, participants commented that online courses might, in the future, offer benefits for students needing remediation or credit recovery, but that such students would need more support from teachers, mentors or others who could support the students and help sustain the students' motivation to complete courses.

VSP participants that measured attendance by course completion (rather than by contact hours) were required to submit final examinations to TEA for review if those exams were not one of three VSP-approved assessment instruments: 1.) End-of-course exam authorized by TEA in Algebra I, Biology, English II and U.S. History; 2.) College Board AP exam; or 3.) Credit by examination administered by Texas Tech University and the University of Texas, as already approved by TEA. In some cases, the assessments (including those developed by University Charter School Online Campus and Duncanville ISD) had been previously approved by TEA. Vendors developed most of the tests that participants submitted for the VSP, although a few tests were developed by school district staff. TEA found one end-of-course examination that could be judged as an "acceptable" measure of course mastery. The remaining tests were judged inadequate and VSP participants were notified that FSP funding for those students would not be granted.[8] In making this determination, TEA assumed that the content of the final examination reflected the content and level of difficulty of the course itself. It is possible that some tests were not aligned to the course curricula and that, if the entire course were reviewed, a different conclusion would be reached. The scope of the VSP study did not permit review at this level of detail and did not measure alignment of the course and final examination.

[8] Districts were permitted to grant the students course credit even if the examination they took was determined to be inappropriate to meet the requirements for funding.

(4) Electronic Course Costs and Funding Alternatives

This section presents information about the reported costs for several virtual learning models and describes the funding models developed by TEA.

Virtual Learning Cost Analysis

The cost analysis was conducted within the framework of TEA's account code structure for public schools.[9] This structure is defined in the Public Education Information Management System (PEIMS) data standards guide, and classifies expenditures by several categories, including:

- Fund–source of funding for the expenditure, such as the General Fund and special revenue funds
- Function–relates to the purpose of the expenditure, such as instruction, school leadership, general administration, and transportation
- Object–type of expenditure, such as salaries, supplies, equipment or contracted services

The costs of electronic courses were also analyzed in terms of the "behavior" of costs. For example, start-up costs relate to one-time or infrequent expenditures required to start the program and begin operations. Recurring costs are those costs incurred each year the program is in operation. The accounting system for public education does not incorporate reporting that distinguishes start-up from recurring costs, nor does it provide guidance for allocating costs between the regular program and electronic courses. To report information for this study, school districts and charter schools each made their own determination about the types of costs involved in providing electronic courses and the allocation of costs among programs offered within the district or school. The Study Team generally did not attempt to revise the reports of VSP participants to make uniform distinctions about the type or allocation of costs.

Methodology

The Study Team collected financial information from VSP participants using survey instruments, telephone inquiries, and site visits to interview program staff. The time frame for completion of the report precluded the use of PEIMS financial information from TEA to describe or supplement the financial information supplied by VSP participants. Information submitted by VSP participants was cataloged and analyzed to differentiate start-up costs and recurring costs for electronic courses.

VSP participants agreed in the application process for the VSP program to collect data and submit the information to the Study Team; however, funding was not provided through SB 975 and many pilot schools were limited in the personnel and resources they were able to dedicate to the program. In some cases, insufficient resources posed a barrier to administering the program and collecting data appropriate for the completion of a detailed cost analysis.

Description of Models Applied

As mentioned above, a variety of definitions exist for "electronic courses." In some models, electronic courses are used in addition to a student's regular education program, but do not necessarily replace or reduce many of the costs of the student's basic education. For example, some teachers are using technology and the Internet to enhance traditional classroom instruction. These Web-enhanced courses use online resources and electronic activities to supplement the regular classroom format. In these types of models, the district may still provide transportation to and from school, classroom space for a portion of the day, and other teaching resources for other classes, keeping the costs of the student's basic education the same.

According to research studies and reports from other states, some recurring costs of the basic education may be reduced or avoided and are replaced with the cost of virtual learning, which may be lower.
Web-based courses that have instruction and administration delivered primarily over the Internet may involve few face-to-face interactions between teachers and students and may require students to provide resources such as their own technology, and "classroom," thus potentially lowering the school district's cost of a student's basic education. This study was unable to verify these findings in Texas.

Because of the wide dispersion of electronic courses in the VSP, and because information about the costs associated with electronic courses was lacking, the Study Team was unable to draw any definitive conclusions regarding costs.

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[9] Distance learning is a PEIMS field for reporting course completion, and the field can be expanded to indicate Internet course or videoconferencing plus Internet. Reports of enrollment in distance learning (or Internet courses) are not part of the financial reporting system for public schools.

Cost Analysis of Specific Models

Costs incurred by all VSP participants were reported through written surveys, and three of the 12 sites were selected for financial site visits for the purpose of identifying a detailed sample of cost structures. Expenditures were categorized by PEIMS Object and Function codes as described above. Functions identified as applying to a virtual learning program during the study were Instruction, Curriculum Development and School Leadership. These are defined below:

- *Instruction*–Activities that deal directly with the interaction between teachers and students. Instruction may be provided for students in a school classroom or in other learning situations, such as a home or hospital.
- *Curriculum Development*–Expenditures that are directly and exclusively used to aid instructional staff in planning, developing and evaluating the process of providing learning experiences for students, including expenses related to research and development activities for the development of new or modified instructional methods.
- *School Leadership*–Expenditures incurred in the direction and management of electronic courses including activities performed by the principal, assistant principals and other assistants to supervise operations, evaluate staff members and coordinate instructional activities.

Because the size and format of each site's pilot program differed so widely, an adjustment was necessary to put the costs into a comparative format. Two components were considered in adjusting the number of students participating in the program during the time frame when costs were incurred.

First, we assumed that a full-time virtual student would take five electronic courses during one semester. Because the Study Team found that some students take only one course and others take up to five courses at a time, the total number of electronic courses taken by all students at each site was totaled and divided by five. This calculation was used to identify the number of full-time equivalent students taking electronic courses at each site.

A second consideration made in calculating the number of students was the assumption that at times students start but do not complete courses during a set semester due to dropout or slow progression through the course. In these cases, the number of students and courses administered was calculated by taking an average of the number of students and courses during the middle of the semester. Sites reviewed both estimations to confirm their validity.

Each site's start-up costs and recurring costs were totaled. The two types of costs were divided by full-time equivalents so that each program could be compared on a cost per full-time equivalent basis.

Surveys. Written survey instruments about cost and finance issues were distributed to all VSP participants. Cost and finance data collected from surveys resulted in a wide range of responses. At times the responses were incomplete or reflected misunderstanding of the survey questions. Follow-up telephone calls did not result in improved information. As a result, survey data was not considered useful for the purpose of reporting the approximate cost of providing a virtual learning program. Key observations in this chapter thus depended on the detailed analysis performed during the three site visits with a financial focus.

Site Visits. The three financial site visits were completed during the spring 2002 semester and included interviews and follow-up phone inquiries. Findings relating to the cost structure of each model are summarized below.

Site 1 is part of a Texas Independent School District that offers Web-enhanced instruction courses to elementary and middle schools in the district and Web-based virtual learning courses to high school students. Site 2 is a charter school that offers all classes in a self-paced format. Site 3 is a charter school with nine students taking virtual courses through their Virtual High School.

Start-Up Costs and Recurring Costs at Visited Sites

VSP participants' classification of virtual learning program start-up costs and recurring costs was inconsistent and difficult to summarize due to the wide range of models used. For example, computer purchases at some VSPs were considered a

one-time cost necessary to implement the program. Other pilot sites did not recognize this cost as being associated with the electronic course because computers were considered the responsibility of the students. In other words, the cost was shifted to students in those cases despite the fact that the Agency required that VSP students be given access. Further, other sites classified computer purchases as recurring costs since additional computers were purchased each year as enrollment increased. Another example of inconsistent treatment is the classification of professional staff resources for electronic courses. Some sites used regular program teachers to monitor student attendance and progress. Others used regular teachers to provide e-mail support to students. Some pilot sites allocated the cost of regular teachers who supported electronic courses to the electronic courses, but others did not make this allocation.

Site 1. The district implemented its Virtual School Department in January 2000 and administered courses purchased from a third-party vendor to approximately 300 students. Most of the students (about 180) were taking no more than two courses in the department. These students worked in a modified traditional classroom format supplemented by work in a computer lab that incorporated computer and Internet activities. Web-enhanced classes were administered by the district's regular teaching staff and included an e-teacher to assist the class with grades and questions about the electronic course. E-teachers were included in the costs of the Virtual School Department. Although regular teachers supported electronic courses, Site 1 did not include them as a program cost.

Home-schooled students participating in the district's virtual offerings took at least four courses during the semester. These students (about 20) met with an e-teacher about two times while taking the courses and e-teachers were available by request at any time.

The remaining virtual program participants were high school students (about 100) taking either an advanced placement (AP) course for high-school credit or an AP review course designed to prepare high-school students for the national AP exam. Students had the flexibility to work on these courses during available study periods at school or at home. A mentor through the third-party vendor was available to students at least two times each week. The cost of the mentor was part of the electronic course purchase agreement.

During the next two years, which includes the time period the district participated in the VSP, student enrollment in the Virtual School Department increased steadily. The district administered electronic courses to approximately 600 students in 2000-01 and 800 students in 2001-02. (Not all students taking courses in the Virtual School Department were part of the VSP.) During these two school years, approximately 30% of the virtual program's participants were high-school students taking one to two AP courses, less than 10% were home-schooled children taking at least four courses, and the remaining students were middle- and elementary-school children taking core courses with Web-enhanced class work. Site 1 has purchased computers each year since implementation of its program as additional students enroll in electronic courses. These capital purchases were classified as recurring costs for Site 1, at least until the program enrollment is no longer expanding significantly. **Exhibit 13** shows that start-up costs for Site 1 were not available to the Study Team.

Exhibit 13
Start-Up Costs at Visited Sites
Spring 2002—Site 1

Account	Object	Site 1
Salaries & Benefits	6100	
Purchased & Contracted Services	6200	
Materials & Supplies	6300	
Other Operating Expenses	6400	
Capital	6600	
Total Start-Up Costs		NI
Total Courses Administered to Students		432
FTE Adjustment (5 courses)		86.4
Start-Up Cost per FTE Student		NI

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys and site visits
NI = No information

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When asked about recurring costs, Site 1 indicated percentages of total annual costs that should be allocated to Instruction, School Leadership and Curriculum Development. Total expenditures for the pilot semester were totaled and distributed to each function category at 34% (Instruction), 24% (School Leadership) and 42% (Curriculum Development).

Salary costs included in the Instruction function for Site 1 of $184,103 represented the cost of the e-teachers who worked with virtual students. Site 1 did not include salaries of teachers delivering Web-enhanced courses. The three-year average expenditure for computers was also included in Instruction.

School Leadership expenditures of $227,422 included the salaries of several Virtual School Department staff members involved in the management and supervision of the program.

Although the salaries of teachers delivering Web-enhanced courses were not included in the expenditures of the Virtual School Department, $20,495 is the cost of third-party vendor electronic courses delivered by these teachers. Semester-based recurring costs appear in **Exhibit 14.**

Exhibit 14
Recurring Costs per Semester
per Full-time Student at Visited Sites
Spring 2002—Site 1

Function & Object Description	Object	Site 1
Instruction		
Salaries & Benefits	6100	$184,103
Purchased & Contracted Services	6200	$1,234
Materials & Supplies	6300	$16,591
Other Operating Expenses	6400	$3,613
Capital	6600	*$16,000
School Leadership		
Salaries & Benefits	6100	$227,422
Purchased & Contracted Services	6200	$871
Materials & Supplies	6300	$11,711
Other Operating Expenses	6400	$2,550
Curriculum Development		
Salaries & Benefits	6100	$129,955
Purchased & Contracted Services	6200	$1,524
Materials & Supplies	6300	$20,495
Other Operating Expenses	6400	$4,463
Total Recurring Costs		**$620,532**
Total Courses Administered to Students		432
FTE Adjustment (5 courses)		86.4
Recurring Cost per FTE Student		**$7,182**

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys and site visits

* Note: This program implemented a virtual learning program in January 2000; therefore, this figure is an average of capital purchases from January 2000 – May 2002.

Site 2. This charter school delivered virtual classes in core subjects to 34 students, with all but one of these students taking five courses each. Students took courses at home on a self-paced schedule.

The Virtual School courses were administered, supervised, assessed and monitored by one full-time principal. Site 2 purchased third-party vendor software to deliver electronic courses to the students. Student login time was monitored

and cataloged on a central report that was regularly assessed by the principal. Additionally, inactivity during a login period greater than a set time caused the student to be automatically logged out and triggered an alert message to be sent to the principal.

Students met with the principal at the beginning of the course and by request as often as necessary. The principal regularly sent e-mails to each student, or parent when appropriate, during stages in the student's coursework. For example, the principal often sent an e-mail to congratulate a student and discuss the next section of a course after completion of a test. Additionally, the principal contacted the student and parent by e-mail when a student had a low level of login time on a course.

Teachers involved in the charter school's regular program were available by request for all virtual students; however, the charter does not allocate this teacher time as a cost of the Virtual School.[10] Students had a computer lab available during specific hours to work on courses, but most of the virtual students had computer and Internet access at home and did not use the lab as often as anticipated. Virtual School students took tests at the proctored computer lab. The computer lab was provided for the school's regular program, and the charter school did not list it as a cost to the Virtual School, though it could be argued that some part of the lab cost should be allocated to it.

Site 2 purchased a laptop for the principal/Virtual School teacher. An additional start-up cost at Site 2 was incurred for the training necessary to administer the third-party vendor's product to the students. While not a one-time-only cost, such training occurs infrequently and was measured as a start-up cost in Site 2. Start-up costs for Site 2 appear in **Exhibit 15**.

Exhibit 15
Start-Up Costs at Visited Sites
Spring 2002—Site 2

Account	Object	Site 2
Salaries & Benefits	6100	
Purchased & Contracted Services	6200	$2,000
Materials & Supplies	6300	
Other Operating Expenses	6400	
Capital	6600	$3,200
Total Start-Up Costs		**$5,200**
Total Courses Administered to Students		*188
FTE Adjustment (5 courses)		37.6
Start-Up Cost per FTE Student		**$138**

*Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys and site visits*Note: Average students and courses administered during April and May 2002.*

Site 2 reported recurring costs for the full-time salary for the principal. A portion of this salary is allocated to each of the three function codes, with about 10% ($2,632) listed under Curriculum Development to estimate time spent by the principal on aligning the curriculum with TEKS, creating policies and developing final exams. To adjust for the semester time frame, and since the principal both delivers and manages the virtual program, half of 90% of the salary expenditure ($11,844) was divided between Instruction and School Leadership. The charter school did not include the salary expenditures of regular teachers who voluntarily gave assistance to students in the virtual learning program.

Costs allocated to School Leadership included software for the principal's laptop, cellular phone charges, advertising, mileage expenses and travel to conferences and meetings about electronic courses and the VSP. These costs totaled $4,884.

[10] Another approach would be to include cost of the time teachers spend working with students in electronic courses because, without the presence of the regular program teachers, the charter school would have to purchase these support services.

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Site 2 incurred additional Curriculum Development costs from the purchase of third-party vendor licenses. The annual cost of the licenses totaled approximately $29,000 for the students to use Web-based courses from the company. This figure is listed at 50% ($14,500) to adjust the value to the semester spent in the VSP. Semester-based recurring costs for Site 2 appear in **Exhibit 16**.

Exhibit 16
Recurring Costs per Semester
per Full-time Student at Visited Sites
Spring 2002—Site 2

Function & Object Description	Object	Site 2
Instruction		
Salaries & Benefits	6100	$11,844
Purchased & Contracted Services	6200	
Materials & Supplies	6300	
Other Operating Expenses	6400	
Capital	6600	
School Leadership		
Salaries & Benefits	6100	$11,844
Purchased & Contracted Services	6200	
Materials & Supplies	6300	$768
Other Operating Expenses	6400	$4,116
Curriculum Development		
Salaries & Benefits	6100	$2,632
Purchased & Contracted Services	6200	
Materials & Supplies	6300	$14,500
Other Operating Expenses	6400	
Total Recurring Costs		**$45,704**
Total Courses Administered to Students		*188
FTE Adjustment (5 courses)		37.6
Recurring Cost per FTE Student		**$1,216**

*Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys and site visits*Note: Average students and courses administered during April and May 2002.*

Site 3. The focus of the Virtual High School at Site 3 was students who had jobs that prohibited attendance during regular school hours, dropout recovery and home-schooled students. Most students at Site 3 were taking only one electronic course.

At Site 3, employees involved in the regular charter school program administered the electronic courses. This site did not report having any employees dedicated full-time to the virtual program. Several staff members shared the responsibility of developing and delivering the virtual courses. Many of these duties were completed on a voluntary basis, according to Site 3 administrators, meaning that regular program teachers undertook this additional duty without a stipend or change of responsibilities. Over time, it may be unrealistic to expect teachers to undertake voluntary extra duties, meaning that Site 3 would incur costs for the duties currently provided by volunteers.

Site 3 purchased eight computers for a lab used by students taking virtual courses. This expenditure was listed as a start-up cost. Additionally, these computers were available during limited times by students in the regular program. A start-up cost of $1,200 allocated to Salaries and Benefits results from a percentage of the principal's time that was spent during the development of the program. The principal estimated that about 40% of this full-time position during the spring semester involved Virtual High School duties and that 10% of that amount is a cost that the site does not expect to incur in future semesters.

Salaries for developing electronic course curricula at Site 3 involved a teacher from each core course who developed the respective electronic course using spreadsheet, presentation and word processing applications already purchased by the charter school regular program. The salary cost was calculated by an estimate of 20 hours for each of the eight teachers to develop an electronic course (8 courses X 20 hours X $20 = $3,200). Start-up costs for Site 3 appear in **Exhibit 17**.

The costs at Site 3 are high on a per FTE-student basis because of the low enrollment (nine students). This school's target is to have more students enrolled in virtual learning programs in future years. Additional operating costs are expected to be incurred, but the overall cost per FTE-student is expected to be lower.

Exhibit 17
Start-Up Costs at Visited Sites
Spring 2002—Site 3

Account	Object	Site 3
Salaries & Benefits	6100	$4,400
Purchased & Contracted Services	6200	
Materials & Supplies	6300	
Other Operating Expenses	6400	
Capital	6600	$16,000
Total Start-Up Costs		**$20,400**
Total Courses Administered to Students		11
FTE Adjustment (5 courses)		2.2
Start-Up Cost per FTE Student		**$9,273**

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys and site visits

For recurring costs, Site 3 used a percentage allocation method and hourly rate estimate to determine the recurring Salaries and Benefits costs of the Virtual High School. Recurring costs of this program were weekly meetings with teachers; course development; supervision; training; and orientation and technical assistance provided by teachers, the assistant principal, and the principal of the charter school.

Instruction costs for Salaries and Benefits resulted from the estimated number of hours teachers spent with each student and percentages of the principal's and assistant principal's salaries for the spring semester. This figure of $11,460 included three components. First, teachers spent about four hours with each of the nine students with instruction duties, at an estimated rate of $20 per hour. (9 students X 4 hours X $20 = $720).

A second component included a percentage of the assistant principal's salary that was spent instructing virtual students. The assistant principal spent about 40% of the full-time position for the spring semester working with the Virtual High School. About half of the 40% estimate involved student instruction duties at a cost of $3,000 allocated to Instruction. The remaining half of this figure involved School Leadership duties.

As noted in the start-up cost description above, the principal at Site 3 estimated the percentage of time required working with the virtual students as part of this figure included the third component of the cost allocated to instruction salaries. The principal spent about 40% of the position's time during the spring semester on the Virtual High School; 90% of that time involved recurring duties to instruct students each semester at an estimated cost of $7,740. The total expenditures allocated to recurring Instruction Salaries and Benefits was calculated using these three components ($720 + $3,000 + $7,740= $11,460).

School Leadership expenditures at Site 3 included the assistant principal's time supervising teachers, monitoring student login times, delivering an orientation to students and managing the virtual program at an estimated cost of $3,000.

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An amount for course development that Site 3 allocated to Curriculum Development was incurred by taking a percentage of the technology director's salary to account for time spent (about 20%) during the pilot semester training teachers and creating the venue for the electronic courses. Other costs included advertising to the community about the school's electronic course offerings. **Exhibit 18** shows semester-based recurring costs for Site 3.

Exhibit 18
Recurring Costs per Semester
per Full-time Student at Visited Sites
Spring 2002—Site 3

Function & Object Description	Object	Site 3
Instruction		
Salaries & Benefits	6100	$11,460
Purchased & Contracted Services	6200	
Materials & Supplies	6300	
Other Operating Expenses	6400	
Capital	6600	
School Leadership		
Salaries & Benefits	6100	$3,000
Purchased & Contracted Services	6200	
Materials & Supplies	6300	
Other Operating Expenses	6400	
Curriculum Development		
Salaries & Benefits	6100	$2,500
Purchased & Contracted Services	6200	$50
Materials & Supplies	6300	$85
Other Operating Expenses	6400	
Total Recurring Costs		**$17,095**
Total Courses Administered to Students		11
FTE Adjustment (5 courses)		2.2
Recurring Cost per FTE Student		**$7,770**

Source: 2001-02 TEA Study of Electronic Courses and Virtual Learning Programs surveys and site visits

Observations

Determining the cost of providing electronic courses is a complex task, as demonstrated by the wide range of cost estimates provided by districts and charter schools in the course of the pilot study. While some of this complexity is explainable based on the approach taken (for example, buying courses versus developing courses locally), other aspects of this complexity are more difficult to explain or predict. This is primarily because districts and charter school choices affect the eventual cost of electronic courses, both in terms of start-up and recurring cost.

In analyzing the costs of virtual learning, the Study Team made two observations. The first observation is that the start-up cost of a virtual learning program is highly dependent on the need for computers and Internet access and the decision to either purchase a course or develop it in-house. Some school districts have computer labs with excess capacity, allowing additional computer use for on-site virtual learning without start-up costs. However, the in-place computers in the lab represent an ongoing cost for the electronic courses. As a user of excess capacity, virtual learning programs should be charged for some of the investment and ongoing maintenance costs of existing computer labs. No districts surveyed were reimbursing students for use or maintenance of home computers, although there were cases in which schools loaned a computer to a student.

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There is insufficient information to identify and compare the costs associated with in-house development of courses and purchase of courses developed by others. VSP participants that developed courses reported a wide range of development costs. One participant was able to develop a course for less than $2,000. Another participant estimated development at over $50,0000 per course. Participants were not able to break out the components of development cost and offered information on in-house course development as estimates. The cost of purchased courseware is easier to find, but can be difficult to estimate on a course-per-student basis. A school district may purchase a license for a certain number of students to use a course. If the district signs up fewer students than the license permits, the cost per student rises. If the school purchases many products from a course provider, the per-course price is likely to be lower. A cost analysis of purchased courses depends on many variables that were not available to the Study Team during the first year of the pilot.

The second observation is that current applications of virtual learning have wide cost and savings variances, primarily because of two different models applied. The model applied at Site 1 provides supplemental resources for virtual learning – additional teachers, curriculum developers and program administrators – but because it provides most of the program's students only one or two course offerings during the school day, most of the other costs incurred for that student are not avoided. The models at Sites 2 and 3 are more comprehensive applications of virtual learning that replace many of the costs of traditional education in a school facility. Many teacher costs, some facility costs, transportation costs and related administrative costs are avoided under this approach.

Virtual Learning Funding Options for VSP Participants

The purpose of pilot participation was two-fold. One was to provide information for TEA to use in estimating the costs and benefits of electronic courses for Texas students and school districts. The other was to provide a mechanism for school districts to access foundation school program (FSP) funding for students in certain circumstances who would otherwise not generate state funding.

SB 975 did not provide additional state aid to school districts and charter schools; however, restrictions for funding under FSP state aid calculations, based on ADA, could be waived so that a district could receive up to full funding for students taking electronic courses. Each VSP participant selected one of the following three funding models to be used in documenting claims for state funding. The signed Statement of Interest required selection of only one funding model for all courses offered by the district, charter school, or consortia. VSP participants were not permitted to use multiple funding models.

Funding Model A

Model A, the Contact Time Funding Model, provided districts an opportunity to document student enrollment in certain courses to be eligible for foundation program funding. Enrollment in at least three courses exclusively through a virtual school setting met the half-day FSP funding rule and enrollment in at least five courses exclusively through a virtual school setting met the full-day funding rule. Eligible instructional service was based on a 180-day instructional calendar. If a student completed one or more courses early, funding was not provided unless the student enrolled in an additional course to maintain a continuous course load equal to three or five courses. If student participation in a virtual school setting was combined with physical attendance on the district's or charter school's campus for one or more courses during the instructional day, the standard length of time for instruction in a physical classroom during the seven-period day was applied to VSP instructional courses for determining half-day or full-day attendance for FSP funding. Nine VSP participants (four in fall 2001 and five in spring 2002) selected Model A.

Funding Models B (1) and B (2)

Model B, the Successful Course Completion Funding Model, contained two funding options. Option B(1) offered districts the opportunity to meet the requirements for half-day and full-day FSP funding with three courses or five courses respectively. Option B(2) permitted funding based on course completion calculated in $1/10^{th}$ increments per half-credit course or $1/5^{th}$ increments per one-credit course. Six VSP participants (two in fall 2001 and four in spring 2002) selected Model B (1). Five VSP participants (none in fall 2001 and five in spring 2002) selected Model B (2).

Four fall 2001 VSP participants did not select a funding model because they did not anticipate receiving state funding through the program.

Of the 23 VSP participants in the 2002-03 school year (21 school districts and charter schools and 2 consortia), 13 selected Model A, eight selected Model B(1) and one selected Model B(2). One school district did not anticipate receiving state aid for participation in the VSP and did not select a funding model. Funding claims for additional FSP generated by students participating in the VSP were submitted by three ISDs for an approximate total of 45 students and three charter schools for an approximate total of 66 students.

(5) Waivers for Virtual School Pilot Participants

Four school districts and nine charter schools requested waivers to allow the district or school to alter the method of computation for daily attendance that currently appears in statute. TEA granted all 13 waivers. Charter schools submitted numerous requests for enrollment cap increases and expansion of their boundaries. TEA submitted these requests to the Charter Schools Division to be considered as charter amendments rather than waivers from current law and rule. In accordance with the VSP Terms and Conditions of Participation, requests were denied and in no case were significant increases allowed.

Issues and Challenges

Research reports and studies conducted in other states identify potential benefits of electronic courses and virtual learning. Those in small, remote, and rural districts may gain access to highly qualified teachers through electronic courses delivered at the school or to another location in the community. Students in all districts and charter schools may benefit from availability of advanced courses taught by experts that would not otherwise be available. Electronic courses offer opportunities for students to take advanced high school courses. According to the 2001 Academic Excellence Indicator System, 20.1% of Texas students completed advanced courses in 1999-2000, and 38.6% completed the Recommended High School Program. Greater course availability is likely to increase these percentages. Evidence from interviews and the VSP forum indicate there is a rising need for high-level courses to challenge students and prepare them for college, and electronic courses may be one way to address this need.

A review of the literature also indicates that electronic courses offered through the public education system can benefit home-schooled students whose parents may not have the resources to provide more advanced courses required in high school. Students home schooled for only a few years could benefit by taking some electronic courses that are aligned to the Texas Essential Knowledge and Skills, better preparing the students for the transition to public school. Supporting costs for electronic courses taken by home-schooled students would represent an additional expenditure for the state and local school districts.

Students at risk of dropping out of school because of pregnancy, high mobility, or disciplinary problems may also benefit from access to electronic courses. Several VSP participants reported informally on student success in alternative education programs and home settings using electronic courses.

Benefits of virtual learning are described in newsletters and articles targeted to educators, and new programs such as the VSP can begin with unrealistic expectations on the part of some schools and vendors (course providers). One unmet expectation for the VSP was high demand for electronic courses. Before the start of the VSP in fall 2001, several school districts and charter schools believed they could sign up hundreds of students to take advantage of full-day or half-day electronic course schedules. It was thought that these enrollments would, in turn, generate state funding. In reality, districts and charter schools found that most students desired to take no more than one or two electronic courses and that very few students favor a program that is entirely virtual. Students enrolled in electronic courses were, in most cases, already enrolled in school full-time and did not generate increased state dollars by taking electronic courses.

Another unmet expectation was for state support for online course development. Many VSP participants hoped the state would be able to assist with the cost of developing or modifying electronic courses, but the pilot program offered only FSP funding for students whose electronic course taking brought their school participation up to half-day or full-day status. Those VSP participants that developed courses did so within existing district or charter school budgets or sought grant funding for development.

The prospect of permitting students to be enrolled in school and take courses at locations other than the traditional school led some VSP participants and supporters to hope that the cost of school facilities could quickly be reduced. Lower-than-expected enrollment and anecdotal evidence of strong student ties to the school facility (for peer relationships, extracurricular activities and teacher support) make the prospect of reducing school facility costs seem unrealistic at this time.

Some VSP applicants hoped that electronic courses and virtual learning would significantly reduce the need for (and cost of) personnel to support instruction.To achieve these savings, electronic course enrollments would need to be much greater than they were in the pilot year. Even if enrollment increases, it is not clear that need for instructional personnel will decrease with the growth of electronic courses. Interview and forum comments from several VSP participants indicated that students taking electronic courses still require frequent contact with a teacher, and that teachers would have difficulty providing online support to groups larger than they typically teach in a traditional school setting.

Key Questions

There are three key questions addressed by the VSP study:

1. Are electronic courses and virtual learning educationally beneficial?
2. What is the appropriate level of state funding for online courses?
3. Can the state sufficiently monitor online courses?

1. Are electronic courses and virtual learning educationally beneficial?

The Study Team was unable to determine the unique educational benefits of electronic courses due to the lack of adequate information regarding course completion and course performance.

According to reports and studies in other states, the potential of online courses to benefit students educationally and to improve student performance is promising. VSP pilot participants, regardless of their school size or location, believe that students will have access to a wider number of courses through electronic and online delivery. Small and rural school districts may gain access to highly qualified teachers who are not available locally through electronic courses. VSP programs may provide an additional opportunity for at-risk students who have not been successful in traditional settings.

During interviews and the forum discussion, VSP participants reported that there were educational benefits for different student populations. One group was full-time students who enrolled in courses for additional credit. The other group was students who were not successful in the traditional school setting. VSP participants felt that electronic courses were meeting the needs of these students when other methods had failed.

To determine if online delivery of courses works educationally, courses need to be defined clearly and reported consistently. There also needs to be a mechanism to track or monitor the programs and student performance to determine their effectiveness.

2. What is the appropriate level of state funding for online courses?

The appropriate level of state funding for electronic courses cannot be determined at this time. Appropriate levels of funding and funding mechanisms can be determined once start-up and recurring costs are more accurately identified and accounted for. The VSP has not at this time generated sufficient cost data to support a recommendation for funding mechanisms.

The task of identifying costs for electronic courses is complex, as the wide range of cost estimates provided by districts in the course of the pilot study demonstrates. While some of this complexity can be explained by the approach each VSP participant took (for example, buying versus developing a course), other aspects of this complexity are more difficult to explain or predict. This is primarily because a large amount of school district choice was involved in the eventual cost of the course (both in terms of start-up and recurring costs). The extent to which choice is involved is directly related to costs. In addition, school districts and charter schools are not accustomed to measuring course costs, and administrative staff members may have lacked the information to make accurate reports.

3. Can the state sufficiently monitor online courses?

The state can sufficiently monitor online courses but it must develop clear standards and consistently enforce those standards to ensure compliance.

Like courses offered in the traditional manner, electronic courses offered in Texas schools should be connected to existing state reporting structures such as PEIMS and aligned to Texas Essential Knowledge and Skills (TEKS) so that course information may be audited and monitored.

Findings and recommendations about these key questions follow.

Findings and Recommendations

I. Continue the Virtual School Pilot and give the Texas Education Agency the flexibility to determine appropriate funding mechanisms and student identification and participation controls to allow pilot districts to combine virtual online courses with non-virtual courses to be eligible for up to full ADA funding for enrolled public school students.

Finding 1: The VSP is a new program and unfamiliar to school districts and charter schools. Start-up was late for some participants, meaning that some data collection opportunities were lost. The number of students enrolled in the first year was fewer than expected. Information tracking was difficult because required reporting structures do not offer help to describe electronic courses and the academic outcomes from them. Lack of information is also due, in part, to the short time frame for this study. A number of the pilot programs are in the first year of operation and students have not yet completed their course work. Also, many of the pilots have different school calendars that limit the analysis of educational benefits.

Recommendation 1: Continue the Virtual School Pilot and give the Texas Education Agency the flexibility to determine appropriate funding mechanisms and student identification and participation controls to allow pilot districts to combine virtual online courses with non-virtual courses to be eligible for up to full ADA funding for enrolled public school students. Further study is needed over a longer time period, with a greater number of students and more detailed information, to make a determination about the educational benefits of electronic courses and appropriate funding and accountability structures.

Finding 2: VSP participants have diverse definitions of the term "electronic courses." In order to better study and implement virtual learning programs, a clear definition of "electronic course" should be created.

Recommendation 2: Define "electronic course." The definition of "electronic course" recommended as a result of this study includes the following characteristics:

- 80% online–Most instruction is in an online environment, including the regular interaction between student and teacher (via e-mail or chat rooms), monitoring of student activity, and assessment of student performance with the exception of proctored exams. Occasional face-to-face communications are also necessary at the beginning of a course to ensure all students have a solid understanding of the necessary technology and the course requirements. Additional face-to-face communications may also be necessary throughout the course, depending on course content, student progress and the need for exam security. An electronic course should be based on interaction with a teacher via email or other online communication. "Canned" courses without the ability to interact with a qualified instructor may be helpful as supplemental materials but should not be the entire basis for a course.

- Testing course mastery–assessment is crucial to accountability for course credit awards and funding. Proctored administration of an Agency-approved test as a condition of course credit or funding will continue to be required for "course completion" funding in the VSP.

- Not tied to a specific calendar–Start and completion dates are determined as needed by the participating student; however, a maximum course duration is recommended.

- Not tied to a mandated physical location–Students may be physically located in a school, at home, in a library or in any other venue that provides the technology and access necessary to complete the online course.

- Students have access to technical resources–Courses can be accessed and completed with a generally available level of technology.

Finding 3: Texas funded electronic courses and virtual learning using FSP funds tied to student attendance and course completion. The funding methods offered–Model A for contact hours, and Model B for course completion–are fair and offer flexibility for VSP participants to choose a method that aligns with their program goals but are cumbersome for districts and the Agency. Model B (2) provides funding for as few as one electronic course and allows school districts and charter schools to recover some of the costs of delivering a small number of electronic courses. Exploration of other options is needed. This process is necessary for continuation of the pilot but TEA has expressed strong concern that limitations in

staff in various Agency divisions make it less feasible when the number of students increases. Without evidence that electronic courses represent a potential cost savings or an incremental cost to school districts, it is not possible at this time to develop adjustments to the FSP to recognize electronic course costs.

Recommendation 3: Continue to develop funding models for use in the VSP that work well for districts and the Agency. Determine appropriate funding mechanisms and controls to allow pilot districts to combine virtual online courses with non-virtual courses to be eligible for up to full ADA for enrolled public school students.

Finding 4: The Study Team experienced difficulty collecting data from VSP participants during the 2001-02 year. At this time the state would experience similar difficulties in attempts to monitor electronic courses, making a funding model based on attendance, or contact time, inadvisable.

Recommendation 4: Determine the district and Agency resources that would be required to support the quality assurance and audit requirements for full-scale statewide implementation and develop protocols to monitor electronic courses. Electronic courses can be monitored by the state if districts and charter schools follow reporting guidelines or protocols. Several criteria should be included in these protocols such as enrollment reporting, student performance reporting, attendance records, student completion rates for electronic courses, verification of student attendance, and risk-based monitoring and disproportionality. The Study Team further recommends that participation in the state clearinghouse for virtual programs, the IQ Pilot, be based in part on successful performance as monitored by the state.

Finding 5: Currently, fiscal accounting for electronic courses and virtual learning is inconsistent and confusing. Studies of the cost of electronic courses and virtual school programs should incorporate reporting requirements that permit investigators to identify all or most of the program costs and to distinguish start-up from ongoing costs. This information, in turn, will help investigators determine whether there are savings to be gained from offering electronic courses or whether electronic courses and virtual learning are more costly than comparable traditional courses.

Recommendation 5: Cost accounting guidelines for electronic courses and virtual learning should be provided to VSP participants. Rules also need to be developed that prescribe how VSP participants should allocate regular program costs to the electronic courses, where applicable.

Guidelines and rules will increase data consistency and comparability. They will enable districts and charter schools to make timely and accurate reports.

Finding 6: The VSP participants decided not to use current biometric devices or procedures to verify the participation of individual students in electronic courses. At this time, biometric devices are too costly. In addition, many of the current biometric devices have not proven reliable enough to justify their high expense. Rather than use biometrics, VSP participants relied on more time-intensive methods of verifying student participation such as using teachers to track reports of logon time and course activities generated by the course software.

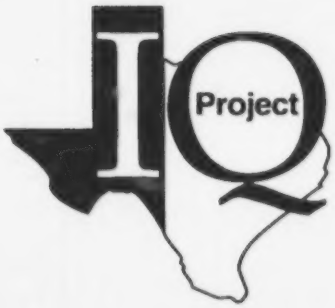
Recommendation 6: Continue to evaluate attendance monitoring and security options. While the purchase and use of biometric devices does not currently make sense for schools and districts offering electronic courses, this arena of technology is quickly advancing. Security options, including those presented by biometric devices, should be explored and evaluated as technological changes occur. This will become especially important if the number of students enrolled in electronic courses continues to expand. Currently, the number of students taking electronic courses has been small enough that more time-intensive methods of verifying identity and ensuring security can be used. However, as student enrollment in electronic courses grows, alternative methods for identity verification will become essential.

Finding 7: The VSP participants were not able to signify which courses were electronic courses by using the PEIMS system. PEIMS course completion codes identify how the course is delivered, such as through the Internet, but do not provide a way to determine if a specific course, such as Algebra 1 is offered virtually. This lack of a consistent course identifier will make it difficult for the state to track electronic courses.

Recommendation 7: Explore options for PEIMS reporting of electronic courses. Options for reporting electronic courses through PEIMS should be developed to address the information needs of school districts and TEA.

Section II

INVESTIGATING QUALITY OF ONLINE COURSES



Investigating Quality of Online Courses

A Report to the 78th Texas Legislature on Investigating Quality of Online Courses

A pilot project conducted by the Texas Education Agency in partnership with the Region IV Education Service Center Distance Education Services Department

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Investigating Quality of Online Courses

Passage of Senate Bill 975 in the 77th session of the Texas legislature created a pilot program, the Virtual Schools Pilot (VSP), by which the TEA could gather data on school-offered, Internet-based courses. In this pilot, methods of tracking student participation in online courses were studied to establish the feasibility of state funding for these courses. Texas, like many other states, has developed rigorous academic content standards defining student expectations and requirements. Until recently, however, no comparable statewide standards existed to address student achievement and academic excellence for Internet-based courses. As the demand for these types of courses rises, Texas educators must provide assurance online courses being offered are of the highest quality in all respects. Therefore, in parallel with the VSP, the Investigating Quality of Online Courses Pilot (IQ Pilot) was established in partnership with the Region IV Education Service Center (ESC) Distance Education Services Department.

Background

In preparation for the project, Region IV ESC conducted a review of current literature regarding the development and use of quality of service guidelines for K-12 Internet-based courses. While there are numerous ongoing discussions surrounding the development of guidelines for online courses offered by higher education institutions, there is limited dialog being conducted on the development, implementation, or impact of guidelines at the K-12 level. Although the number of elementary and secondary schools around the country offering online courses is growing[1], there is little evidence that these courses are being evaluated prior to enrolling students by comparing the courses to a set of widely accepted and thoroughly researched state standards. At this time, it is more often than not the responsibility of the administration at an individual school or district to determine the quality of courses by making an independent judgment. Effective review of courses is considered by many districts to be a significant, if not overwhelming, burden.

Institutions of higher education are offering the vast majority of online courses within the education community. About two million students now take online courses from U.S. higher education institutions[2] as compared to 44,000 K-12 students enrolled in online courses during the 2001-2002 school year[3]. The most widely accepted set of standards used by colleges and universities to determine program quality[4] is the *Principles of Good Practice for Electronically Offered Academic Degree and Certificate Programs*[5] authored by the Western Interstate Commission for Higher Education. This group, representing the Western states' higher education regulating agencies, higher education institutions and the regional accrediting community, developed these twenty-two standards of quality in online learning.

Another widely used document, the Southern Regional Education Board's (SREB) *Principles of Good Practice* and the accompanying evaluation matrix, the *Essential Principles of Quality*[6] have been used to review online courses and programs listed in the SREB's *Electronic Campus* web site. Like its predecessor developed by the Western Interstate Commission, the SREB's guidelines enumerate standards in the areas of curriculum and instruction, institutional context and commitment, and evaluation and assessment.

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[1] Clark, Tom, Ph.D. (2001, October). Virtual Schools: Trends and Issues. WestEd: Distance Learning Resource Network and Western Illinois University: Center for Application of Information Technologies.

[2] Symonds, William C. (2001, December 3). Giving It the Old Online Try. Business Week Online Magazine [Online], Issue date: Dec. 3, 2001. Available: http://www.businessweek.com

[3] Symonds, W. C. (2001).

[4] Hoskins, Dr. Barbara J., Dr. Stephen B. Walter, Dr. Linda B. Reardon. (2001, February 10). Guidelines for Online Course Development and Evaluation. Clemson University, Tri-County Technical College, and South Carolina Partnership for Distance Education. Available: http://www.scpartnership.org/grants/SCPDE Grant Final Report.Clemson.htm

[5] Western Cooperative for Educational Telecommunications. (1999, September 22). Principles of Good Practice for Electronically Offered Academic Degree and Certificate Programs. [Online] Available: http://www.wiche.edu/telecom/projects/balancing/principles.htm

Investigating Quality of Online Courses

Several non-profit, distance education organizations have developed quality standards for online courses delivered to K-12 students. *Guiding Principles for Distance Learning in a Learning Society* was created by the American Council on Education and The Alliance: An Association for Alternative Programs for Adults. This set of standards is divided into topics including learning design, learner support, organizational commitment, learning outcomes and technology.

The National Education Association (NEA) has also developed an evaluation guide for assessing Internet course quality. This document is titled the *Quality Checklist for Distance Education Courses* and was developed by the organization's Professional Standards and Practices Committee. The checklist addresses quality of service issues such as academic rigor, instructor preparation, infrastructure considerations and student rights.

Online course providers have also developed instruments to evaluate the quality of their own courses. The Michigan Virtual High School, the Virtual High School of the Concord Consortium, and the Florida Virtual High School have all developed internal evaluation matrices to gauge the quality of their products. These evaluation tools range from a simple table of instructional design and delivery, content and assessment components to be used as a self-check by course developers to a formal evaluation process completed by course instructors.

Studies suggest that numbers of K-12 students enrolled in Internet-based courses will continue to rise from 21,000 during the 2000-2001 school year to over 44,000 during the 2001-2002 school year[7]. With increased levels of state funding, these numbers may double or even triple within two to three years. Historically, the most common barrier to success of a virtual school program for elementary and secondary students was (and continues to be) lack of funding[8]. Increased amounts of federal and state funding pending in legislatures across the country may effectively remove this barrier and allow expansion of opportunities in distance education for large numbers of K-12 students in Texas and other states.

With this potential rise in enrollment and subsequent opportunities for profit making, there will be an increasing number of businesses, non-profit organizations and individuals offering course content and delivery to students. It will be increasingly difficult and time-consuming for those school administrators wishing to identify quality courses to meet their specific students' needs to choose with confidence from among the many offerings available. Development of a set of state guidelines may aid these administrators in evaluating courses thoroughly. In addition, an online database in which results of course evaluations conducted by qualified reviewers from which reports on individual courses may be generated may be of value to administrators who do not have the resources to conduct evaluations in their own districts.

Program Goals: To establish and pilot quality of service guidelines for online courses to provide assurance to the state, school districts and campuses that courses meeting these guidelines will be of the highest quality in all respects and that they address student achievement and academic excellence.

Program Outcomes: A set of recommended standards to serve as guidelines for evaluating quality of service elements for Internet-based courses; a checklist that will provide a quantitative and qualitative tool to compare courses against the set of standards; and a pilot to validate the guidelines developed.

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[6] Southern Regional Education Board. (2000-2001). *Principles of Good Practice.* [Online] Available: http://www.electroniccampus.org/student/srecinfo/publications/Principles_2000.pdf

[7] Symonds, W.C. (2001)

[8] Symonds, W.C. (2001)

Phase I

Stakeholders from Texas and across the country were invited to participate in the process of developing quality of service guidelines for online courses. The resulting working committee of 28 included representatives from school districts currently participating in the VSP or offering online courses, regional education service centers (ESCs) in the state; Texas higher education institutions that are currently engaged in delivering courses via the Internet to their students; distance education-related professional organizations; and online course providers. The resulting guidelines and an accompanying evaluation matrix are the result of the efforts of state and national experts whose task was to develop a tool that could be used to improve the quality of Internet-based courses for Texas' students. A number of valuable assets were used in developing these guidelines including the Southern Regional Education Board's *Principles of Good Practice*, work conducted by the Western Interstate Commission for Higher Education, and resources from other organizations working to establish standards for Internet coursework.

A listing of these resources is available in Appendix G.

Quality of Service Guidelines for Online Courses

EVALUATION MATRIX

This evaluation matrix is a tool to be used for reviewing courses delivered over the Internet. Results of these reviews may be used by school administrators, teachers, parents, and course providers to ensure that Texas' students are provided with only the highest quality Internet-based courses as a part of their educational experience.

While all of the features in the guidelines enhance the quality of web-based courses, it is not necessary for a course to exhibit every component to be considered a high quality course. The first step to effectively using the guidelines is to analyze the needs of the school or student. This assessment will determine which course features are most critical for the intended audience.

I. Course Components

Guideline	Guiding Questions	Does Not Meet Criteria	Meets Criteria	Exceeds Criteria	Comments
A. Course Design					
1. Goals, objectives, and content are clearly and explicitly aligned to TEKS/TAKS or AP guidelines.	Are there explicit statements that describe how the goals and objectives stated in the courses are correlated to TEKS/TAKS or AP guidelines?				
2. Goals and objectives are observable and measurable.	Are the outcomes specified in each learning objective concrete, observable, and measurable?				
3. The course includes a comprehensive online syllabus published prior to course delivery.	• Does the syllabus include: (a) course requirements and structure, (b) time requirements, (c) prerequisite requirements, (d) resource requirements, (e) contact information (teacher, technical, and academic support), (f) course policies and procedures, (g) learning goals and objectives, and (h) testing and grading policies? • Is a course scope and sequence provided?				
4. Clear and explicit alignment exists between objectives, assessments, instructional strategies, content, and technology.	Is there alignment between the behaviors and conditions specified in objectives, assessment items, strategies, content, and technology?				

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(I. Course Components Continued)

Guideline	Guiding Questions	Does Not Meet Criteria	Meets Criteria	Exceeds Criteria	Comments
5. Instructional requirements for online courses are as rigorous as requirements for traditional classroom courses.	Are the assignments, activities, and depth of content presented online equitable to or exceed related courses provided by the same institution in a traditional classroom environment?				
6. The course structure is flexible to allow teachers to meet state and local standards.	Do instructional materials, course, and unit design allow educators to adapt content, instruction, assessments, and technology to meet state and local standards and infrastructure?				
7. The course incorporates provisions which allow compliance with the Americans with Disabilities Act (ADA).	• Does the course have design features that facilitate accessibility for persons with disabilities (visual, hearing, physical, and cognitive)? • Is the course structured in a manner that allows teachers to address ADA requirements? • Does the course have a Bobby Approved status?				
8. The course provides appropriate types and degrees of interactions.	Does the course allow for multiple forms of interactivity among participants to (a) provide timely and frequent feedback, (b) establish a learning community, (c) engage students, (d) enhance student motivation, and (e) give students an active voice in their learning process?				
9. The course provider's credentials are available for review.	Is the course developed by a qualified team consisting of content experts, instructional designers, and graphics/media designers?				
B. Course Content					
1. Course content is organized in a manner to facilitate learning.	Is content presented in segments (e.g., units, modules, paragraphs) appropriate for online learning?				
2. Course content is accurate, current, free of bias, and sufficient to meet learning goals and objectives.	• Is content factual, free of error, and up-to-date? • Is content culturally diverse? • Is there sufficient information provided to meet learning goals and objectives?				
3. The course contains carefully selected links that are reliable and valid.	• Is there an appropriate number of links? • Are all of the links in the course working properly? • Do the linked sites provide accurate and current information? • Does this information clearly correlate to learning objectives?				
C. Instructional Strategies and Activities					
1. Instructional strategies support the achievement of learning objectives based on a combination of experience, research, and theory.	Do instructional strategies vary according to the desired type of learning outcomes (e.g., verbal information, concepts, procedures, rules, problem-solving, cognitive strategies, attitudes, psychomotor skills)?				
2. Instructional strategies allow teachers to address the needs and preferences of individual students.	Are instructional strategies and activities customizable to address student needs and preferences for pacing, grouping, feedback, control, communication, and assessment?				

Guideline	Guiding Questions	Does Not Meet Criteria	Meets Criteria	Exceeds Criteria	Comments
3. Sufficient pre-learning activities are available to students to ensure success.	• Does the course identify student readiness (e.g., readiness for online learning, reading level, computer/technology skills, prior content knowledge)? • Are there self-assessments or checklists that identify prerequisite knowledge and skills? • Does the course offer orientations, tutorials, job-aids, activities, policies, and procedures to help students acquire the necessary technical skills and content-specific knowledge?				
9. The course provider's credentials are available for review.	Is the course developed by a qualified team consisting of content experts, instructional designers, and graphics/media designers?				
D. Learning Community					
1. Course materials provide opportunities to facilitate and encourage the development of a learning community among students, teachers, administrators, community members, etc.	• Course materials provide opportunities to facilitate and encourage the development of a learning community among students, teachers, administrators, community members, etc.				
2. The course encourages collaborative methods.	Does the course design encourage collaboration to improve student achievement and meet school/district goals?				
E. Student Assessments					
1. The course includes methods for on-going assessments of student achievement	• Does course include methods for determining if students have required pre-requisite skills and knowledge throughout coursework? • Do course materials include guidelines and/or required timelines for providing feedback?				
2. Quality course materials provide a wide range of assessment tools.	• Are pre- and post testing tools available? • Are measurement tools both objective and subjective in nature? • Do measurement tools include both online and offline assessments? • Do measurement tools provide results for students as well as faculty? • Do course materials include assessment templates or guidelines to help instructors provide feedback? • Is diagnostic or placement testing available?				

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Guideline	Guiding Questions	Does Not Meet Criteria	Meets Criteria	Exceeds Criteria	Comments
3. Quality testing materials provide the teacher with the flexibility to assess students in a variety of ways.	• Does the teacher have access to online testing tools that provide immediate feedback? • Do the teacher and students have access to tools such as chat rooms to provide feedback? • Is security in place to ensure student authentication? • Are multiple versions of the same test available? • Is a test bank available for the teacher's use? • Are tests available using multiple formats (e.g., multiple choice, true/false, essay, etc.)? • Are alternative evaluation methods available (e.g., performance-based assessments such as portfolio assessment rubrics, performance checklists and product checklists)?				
F. Technology Integration					
1. The course uses the potentials of technology and media to facilitate and enhance learning.	• Do technologies and media directly support and enhance learning? • Do visual elements support the content? • Do videos, animations, audio, and graphics support rather than detract from learning? • Does the course use the capabilities of available technologies in an appropriate manner? • Are media used to engage students? • Does the courseware have an autosave feature? • Does the courseware allow students to access previous material? • Does the course require/allow the student to have access from home? • Does the course have a tracking feature to show students where they have been?				
2. Technology and media are seamless to ensure ease of use.	Is it easy for students to use technology and interpret media elements?				
3. Instructional design addresses potential technology failures.	Are there alternative and suitable activities and assignments for students if technology fails?				
4. The course provides alternative delivery modes to enable students to access materials online and offline.	Is course content made available to the user through offline resources as needed (e.g. multimedia components distributed via CD-ROM and Internet)?				
5. Technical requirements for effective use of the course are readily available to the target audience.	• Are necessary plug-ins and browsers available? • Is necessary bandwidth available? • Are any additional devices necessary? If so, are they readily available? • Are minimum specifications clearly defined prior to acquisition and implementation? • Are minimum specifications consistent with current technologies available to target users?				

Guideline	Guiding Questions	Does Not Meet Criteria	Meets Criteria	Exceeds Criteria	Comments
6. The course allows for the customization of features to meet school/district needs	• Does the courseware integrate with the district's infrastructure? • Is the course interface transparent and easy to use? • Does the course allow for customization of the software?				
G. Course Effectiveness					
1. Historical data on course effectiveness is provided.	• Is data available on previous student outcomes? • Are the student demographics of this data detailed?				
2. The course allows for the collection of data for school, district, and state analysis.	• Does the course allow collection of student demographic information? • Does the course allow data collection on student outcomes (e.g., course completion rates, grade distribution, success on AP exams)? • Does the course allow data collection of teacher evaluations of student performance? • Does the course allow for teacher evaluation of course effectiveness?				

II. Academic Support

Guideline	Guiding Questions	Does Not Meet Criteria	Meets Criteria	Exceeds Criteria	Comments
A. Technical Support					
1. The course provider offers adequate technical support.	• Is technical support appropriate and convenient? • Is technical support availability easily identified? • Is technical support accessible through a variety of modalities (e.g., telephone, email, FAQs)?				
2. The course provider offers initial and follow-up technical training/support on how to effectively utilize the course.	• Is a user orientation available including practice sessions prior to beginning the course? • Is ongoing training offered to users as they become more familiar with the course?				
B. Student/ Parent Services					
1. Administrative policies are identified.	• Are these policies and procedures available prior to enrollment? • Are the policies consistent with school/district requirements and, if not, will the provider be flexible?				
2. The course provides a structured system for receiving and addressing student/parent concerns.	• Is there a system to process users' concerns and questions? • Does the user receive feedback in a timely manner?				
3. The course provides user access to online resources.	• Does the course have access to a digital library? • Does the course include peripheral technologies such as a graphing calculator when appropriate? • Does the course include a variety of communication tools such as email, chat, bulletin boards, whiteboard, etc.?				
C. Administrative Reports					
1. Student data is housed in a secure environment.	• Is access to student information maintained in a secure environment? • Is student information distributed to outside organizations?				
2. The ability to monitor and report student progress and quality of work is an embedded feature of the course.	• Are users able to access information online such as grades, teacher feedback, reports, etc.? • Are reports distributed to users on a regular basis (e.g. progress reports to school administrators or parents)? • Do reports include clear explanations about grading criteria? • Are communication logs available? • Does the course include administrative reports that can be customized for the user's needs?				
D. Professional Development					
1. Sufficient orientation materials and activities are available to ensure teacher success.	• Does the course offer orientations, tutorials, job-aids, activities, policies, and procedures to ensure that educators have technical and content specific pre-requisite skills and knowledge? • Does the course identify teacher readiness for online instruction (e.g. familiarity with software)? • Do school personnel have access to on-going training as they gain more experience with course tools/features?				

(II. Academic Support Continued)					
Guideline	**Guiding Questions**	**Does Not Meet Criteria**	**Meets Criteria**	**Exceeds Criteria**	**Comments**
2. The ability to monitor and report student progress and quality of work is an embedded feature of the course.	• Are users able to access information online such as grades, teacher feedback, reports, etc.? • Are reports distributed to users on a regular basis (e.g. progress reports to school administrators or parents)? • Do reports include clear explanations about grading criteria? • Are communication logs available? • Does the course include administrative reports that can be customized for the user's needs?				
III. Financial Components					
A. Economics					
1. The course provider offers sufficient information to evaluate school/district costs associated with the course.	• Does the provider offer information on administrative, technical, and operational costs? • Does the provider offer information on other costs (e.g., supplemental resources, payment schedules, volume discounts, arbitration vs. appeal, technical/customer service, indirect costs)?				
2. The course provider offers sufficient information to evaluate student costs associated with the course.	• Does the provider offer information on tuition and/or registration costs? • Does the provider offer information on testing costs? • Does the provider offer information on other student fees?				
B. Company Background					
1. Information about the provider's company is provided.	Does the provider furnish information about its history, company principles, and academic partners?				
2. References are provided.	Is a list of current users and contact information available?				
C. Intellectual Property					
1. The course provider has a policy in regard to intellectual property of course materials.	Does the course provider furnish a statement that defines intellectual property rights for the course?				
2. The course provider has a written copyright policy.	Does the provider's policy indicate that all course materials and delivery methods comply with existing copyright laws?				
D. Marketing					
1. The course provider assists in marketing on-line courses to the community.	Does the course provider describe ways they will address community awareness and education?				
2. The course provider assists in marketing on-line courses to students, teachers, and administrators.	Does the course provider describe ways they will address internal audience awareness and education including professional development/promotion, school board/administrator awareness, and student awareness?				

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Quality of Service Guidelines for Online Courses

Summary Evaluation of the Course

Course is: ☐ Recommended ☐ Not recommended

Course: _____

Course Provider: _____

Reviewer: _____

Date: _____

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Feedback Process and Results

The guidelines developed during Phase I were posted on a public viewing site inviting comments (http://www.iqstandards.info). The general public was invited to review both the set of guidelines and the evaluation matrix. Thus far there have been very favorable comments and recommendations received. The guidelines have also generated national interest and inquiries about the project were received from a number of agencies and institutions outside of Texas. Feedback from Texas school superintendents has also been favorable and many have indicated the need for this project.

Phase II

Phase II of the pilot was designed to validate the guidelines developed and provide a database tool to house course provider, evaluator and evaluation data. Course providers were invited to submit courses for evaluation and course evaluators were recruited from across the state. At the same time, the database tool was developed for use during this phase.

Course Providers

Invitation letters to participate in the project were sent to a wide variety of online vendors (course providers). The following course providers submitted courses for evaluation.

- Class.com, Inc.
- Florida Virtual High School
- Houston ISD
- Plano ISD
- Red Comet.org
- The Institute for Mathematics and Computer Science

A total of eighteen high school and middle school courses were submitted to the pilot by the six course providers.

1. American Government
2. Be prepared for the AP Computer Science Exam
3. Biology
4. English 9th Grade
5. English 10th Grade
6. English 11th Grade
7. English IV
8. English Language Arts and Reading (Grade 7)
9. Geometry
10. Health
11. Logic for Mathematics
12. Math (Grade 7)
13. Physics 1A
14. Physics 1B
15. Science (Grade 7)
16. Social Studies (Grade 7)
17. World History A
18. World History B

Evaluators

A process was established for recruiting and qualifying teachers who may be interested in participating as evaluators in this project. Evaluators must hold a Texas Teaching Certificate and must be able to demonstrate their qualifications to evaluate online curricula. Evidence of qualifications includes completion of the Web Instructors' Certification Course or similar programs from recognized programs such as the Center for Distance Learning Research, Texas A&M or Oklahoma University certification programs. Additional information on the Web Instructors' Certification Course is located in Appendix E. Teachers may also qualify if they are able to document extensive experience in online instruction.

Evaluators were recruited from across the state to meet the requirement for a diversified evaluator group and to support the requirement for providing three evaluators per course. The administrators of the project expressed concern about the number of qualified teacher pool available for this project. The number of K-12 teachers with the online experience is growing but it is still a relatively small pool at the current time. This is especially true for curricula targeting middle/ intermediate school aged students.

As an observation, the difficulty in identifying qualified evaluators is an indicator of the lack of teachers trained to teach online courses. This may be problematic for school districts moving into online instruction.

Database Development

Phase II of the pilot included development of a database tool to house course provider, evaluator and evaluation information on courses that have been reviewed by IQ Pilot Project evaluators and meet or exceed evaluation criteria. A report generator will provide comparison data of the reviewed courses to provide a tool for superintendents or other district personnel when making decisions regarding online courses. Only those courses that meet or exceed evaluation criteria will be reported on the IQ web site. Those that do not meet the criteria will not be included in the reports. Course providers will receive feedback from the evaluation process for all courses submitted. Results of course evaluations through the pilot became available in June 2002. Participation in the IQ Pilot is voluntary.

The database tool provides for course and user management. The course manager screen houses the databases for Courses, Evaluations, and Vendors. The course management screen provides for general information on the course, the course provider and the status of the evaluation for that course. The evaluation screen provides a search feature that can be used by authorized personnel to search by a number of categories to find information about a specific course. The Vendor screen houses general/contact information on the course providers that can be accessed through the report menu.

IQ Pilot Summary and Recommendations

Phase I Goals

- Establish recommended standards to serve as guidelines for evaluating quality of service elements for Internet-based courses
- Develop a checklist that will provide a quantitative and qualitative tool to compare courses against the set of standards

Phase II Goals

- Receive public feedback on the IQ Guidelines and make changes through a committee revision process
- Establish an evaluation process to determine the extent to which submitted courses meet the guidelines
- Pilot the use of the guidelines for determining course quality and the evaluation process for efficiency, accuracy and usability
- Receive public feedback on the quality and usefulness of course evaluations

Guidelines and Evaluation Matrix

Phase I established quality of service guidelines and an evaluation matrix to serve as a measure for Internet-based courses. The guidelines developed during Phase I were posted on a public viewing site inviting comments (http://www.iqstandards.info). The general public was invited to review both the set of guidelines and the evaluation matrix. Thus far there have been very favorable comments and recommendations received. The guidelines have also generated national interest and inquiries about the project were received from a number of agencies and institutions outside of Texas. Feedback from Texas school superintendents has also been favorable and many have indicated the need for this project.

No changes were made to the guidelines during Phase II. Several changes to the evaluation matrix were made, however. These included:

- IA7: Addition of the guiding question, "Does the course have design features that facilitate accessibility for persons with disabilities (visual, hearing, physical and cognitive)?"
- ID2: Change of wording to make the guiding question read, "Does the course design encourage collaboration to improve student achievement and meet state goals?" (The question originally read "... improve student achievement and school/district goals?")
- All: Number guidelines and bullet guiding questions.

These changes were made in the working matrix used during the evaluation phase of the project. The changes will also be reflected in the next printing of the evaluation matrix.

Issues: The IQ Pilot addresses issues critical to the development of effective and appropriate policies that will enable high-quality online learning and is pivotal to the accomplishment of the Agency's recommendation for a clearinghouse for online learning.

Recommendations: Expand and fund the IQ Pilot. The IQ Pilot establishes guidelines for online courses to provide assurance to the state and school districts that courses meeting the guidelines will be of high quality and be aligned with the TEKS. Quality of Service Guidelines and a checklist to serve as a measurement tool for evaluating courses have been developed by a committee of state and national distance-learning experts. Committees of content and online learning experts review each course submitted for consideration. Course providers were invited to participate by submitting courses for review by a committee. Results of the reviews are available through the IQ Pilot at www.iqstandards.info/overview.htm.)

Issues: During the course of the pilot, it became apparent that some of the wording in the guidelines and particularly in the evaluation matrix guiding questions was vague or ambiguous. This was indicated by widely varying ratings given by different reviewers to the same question and by the same reviewers in different courses. One of the evaluated courses failed to meet criteria due to just such variations in interpretation. Hopefully, clarification of the wording in the guiding questions would help to standardize responses.

Recommendations: Review and revise the current recommended standards that serve as guidelines for evaluating quality of service elements for Internet-based courses; include final student assessments and student identification prodecures; and pilot the use of the guidelines for determining course quality and the evaluation process for efficiency, accuracy and usability.

Database

Reviewers completed course evaluations using an online form. Results were stored in a database and evaluation reports were generated from the data. Reports on courses that met or exceeded evaluation criteria were converted to PDF format and placed on the IQ website (www.IQstandards.info) to be accessed by the public.

Issues: The database and report generator are functional but basic at this point. Generating and posting reports requires manipulation by the administrator that will be cumbersome should a large number of courses be involved. Some of the database functionality is not as user friendly as it could be and changes to the report headings and format are needed for better readability.

Recommendations: Refine the functionality of the online searchable database of courses and automate report generation. The evaluation reports page of the IQ web site should include an online searchable database to categorize and display reports and a course description should be included for each of the courses listed.

Courses and Course Providers

A total of eighteen high school and middle school courses were submitted to the pilot by six course providers:

Class.com
Florida Virtual School
Houston Independent School District
Plano Independent School District
RedComet.org
The Institute for Mathematics and Computer Science

Evaluations have been completed on all but three of the courses. Packets have been prepared for the course providers, which include:

A copy of the publicly available evaluation report
A copy of a detailed evaluation report
A copy of each of the TEKS alignments performed by the evaluators
An explanation of the procedure used to calculate the course rating
Copies of the IQ Guidelines and IQ Evaluation Matrix documents

Issues: Online courses may be one way to address the need for students to have greater access to the Recommended High School Program.

Recommendations: Determine whether there is a need for specific online courses to be developed or licensed for statewide use to ensure that students have greater access to the Recommended High School Program. If so, estimate the costs and other resources needed to make such courses available statewide and study the possibility of providing needed resources. Options for funding, including grants, should be considered, especially for Recommended High School Program courses for which there are no high-quality online offerings available.

Issues: The process of evaluating courses requires significant resources. Several of the submitted courses failed to meet criteria. When notified of this, the course providers invariably asked if they would be allowed to resubmit the course after making the necessary changes.

Recommendations: Determine the cost to set up a fee-based quality review and approval process for online courses, assessments and student identification procedures, with the expectation that course providers would pay for this. Develop a procedure to allow course providers to submit courses for re-evaluation and streamline review procedures for the evaluators.

Issues: There is a growing interest in online electronic courses delivered over the Internet. Effective review of these courses is considered by many districts to be a significant, if not overwhelming, burden. Students, districts and the state want assurances of quality.

Recommendations: Determine the Agency resources needed to successfully manage large-scale implementation of a state-approval/certification program of online courses that also includes final student assessment and student identification procedures.

Evaluators

A total of twenty-three evaluators were recruited from across the state. One evaluator dropped out of the project before completing any work. Courses were submitted as one-semester offerings due to the way most vendors market their products but reviewers evaluated the courses on the basis of the TEKS, most of which are written to cover two-semester courses.

Issues: To maintain the credibility of the project, evaluator qualifications must be maintained and the pool of evaluators across many disciplines must be increased. The criteria established to qualify evaluators proved to be severely limiting on the pool of candidates. The criteria required that three independent evaluators review each course. Each evaluator must be a subject matter expert in the course reviewed and must have demonstrable experience in online learning. The pilot project identified that the pool of qualified evaluators was extremely low, especially for elective courses such as Health.

Recommendations: Review criteria for evaluator qualifications and develop alternative methods of identifying reviewer candidates to maintain the integrity of the evaluations. Alternate methods of identifying reviewer candidates should be discussed and implemented. One possible solution is to provide for separate reviewers for content and technology integration in subject areas where evaluators having the prerequisite skills are not available.

Issues: The available pool of qualified evaluators determines the number and types of courses that can be evaluated. Across the state, that pool is extremely small. Very few K-12 teachers have had any formalized training to prepare them for the online teaching experience. The problem is compounded by the requirement for multiple evaluators for each course. There is growing interest in online skill development but there is little consistency in training teachers for the experience. There is no registry to archive information on teachers with online teaching skills; therefore, locating and recruiting qualified evaluators is a massive effort. There are no state certifications or requirements for distance learning such as required for other areas of education.

Recommendation: Develop a program to recruit and train teachers who have an interest in learning the technology skills needed to be effective online teachers. Until such time that a large pool of faculty is available, a registry of teachers completing recognized programs may be desirable in order to recruit IQ evaluators.

Information Dissemination Effort: For the program to be fully implemented and effectively used as a quality tool it must be widely disseminated to Texas school administrators.

Issues: Thus far, most of the awareness efforts have been through conference presentations to express the purpose/goals of the project and information on the TEA and IQ Pilot web sites. There is an awareness of the project and general interest on a national scale. Greater effort needs to be directed at Texas school administrators to use the IQ Project as a tool in selecting quality online courses for students. This will have the added benefit of influencing course providers to submit courses for review and to meet the quality guidelines.

Recommendations: A statewide campaign targeting school decision makers as well as course providers should be implemented. A survey of Midwinter Conference participants to determine high-need courses in their districts is recommended. TEA should provide highly visible support for the IQ Pilot that can influence acceptance and use of the program and impact the quality of online courses. Additionally, schools participating in TEA's VSP should be encouraged to submit or have their course providers submit their courses for IQ Pilot evaluation.

Section III

GOING THE DISTANCE: E-LEARNING AND THE TRANSFORMATION OF EDUCATIONAL ENVIRONMENTS

Going the Distance: e-Learning and the Transformation of Educational Environments

Literature Review prepared
by Martha P. Pérez, Ph. D.

Preamble

The information on e-learning today is complex and rapidly expanding due to the increasing scope and the reach of the Internet. Thus, this literature review attempts to distill themes from the multifaceted information available on e-learning and virtual schools. The purpose of this literature review is to inform and provide an overall background for the Virtual School Pilot (VSP) currently underway. The specific task at hand is to expand and update the report *Virtual Learning: The State of the Nation and the State of the State* [1] prepared by Gloria A. McClanahan, formerly of the Educational Technology Division of the TEA (January 2001).[2] *Going the Distance: e-Learning and the Transformation of Educational Environments* is designed as a source guide to various areas pertinent to digital distance education (DDE).

With this in mind, this literature review is organized to: a.) Present an overview of highlights regarding the literature on DDE and b.) To inform the reader through a series of appendices containing summaries, Internet resources, characteristics of virtual high schools across the nation and selected annotated bibliography on the status of e-learning research, issues with virtual schools and e-learners and policies that have been enacted to improve the delivery of education via virtual schools. These sections are intended to be a source of useful information for decision-makers concerning virtual high schools.

The reader is invited to peruse the appendices, which are summaries offered as a complement to the themes highlighted in the text, as needed.[3] **Appendix F** is a summary of benchmarks and action recommendations from the CORD and Concord Consortium study[4] to the Texas Legislature to expand DDE opportunities for all Texas children; **Appendix G** is a summary of additional resources relevant to e-learning, such as online resources, additional bibliographies available online and distance learning networks; and **Appendix H** is a summary describing virtual high schools and some service providers. **Appendix I** provides an example of evaluation categories for network infrastructures for DDE intended to support financial cost estimations and organization; **Appendix J** is a summary of a model of network infrastructure; and **Appendix K** is a selected annotated bibliography offering summaries of various resources, journal articles and their references.

Going the Distance: e-Learning and the Transformation of Educational Environments

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[1] The purpose of the Virtual School Pilot is to advance our understanding of e-learning in the state of Texas. To avoid duplication of efforts, this literature review does not cover the state of districts and schools participating in the pilot program.

[2] After reviewing the literature available in journals, e-journals, books, e-books and online, it is clear that McClanahan's document remains by and large current. Its information is still valid with respect to the status of service providers and organizational features of e-learning at both a national and a state level. The same holds true for Tom Clark's research (2000), upon which McClanahan's based some of her conclusions. This literature review thus follows those same findings.

[3] Perhaps the most germane pieces for Texas decision-makers are to be found in the summaries of: The CORD and Concord Consortium study Technology to Improve Texas Education (2001), The Educational Technology Coordinating Council's State of Texas Master Plan for Educational Technology 2000-2003 Goals and Recommendations, TEA's project IQ (2000) and TEA's (2001) Virtual Learning: The State of the Nation and the State of the State (2001).

[4] Although the CORD and Concord Consortium study was not specifically focused on K-12 educational environments, this research represents valuable first steps that can be applied toward envisioning policy processes for DDE in other environments.

Background:

Distance Education—Information Technology and Business Synergy

Within the last 20 years, universities in industrialized nations have developed distance education media to enhance their educational reach and to offer students flexible educational delivery systems. In the 90s, Internet-based educational programs rapidly proliferated and reached nonuniversity markets.[5] The success of e-learning systems (Tiffin & Rajasingham, 1995; Brande, 1993) compounded by the fast expansion and increasingly competitive cost of these technologies have motivated K-12 educational institutions to begin adopting and designing applications and courses for digital distance education (DDE). In Texas, the number of students enrolled in DDE has increased significantly (McClanahan, 2001).[6] The impact of these new information technologies has policy makers and stakeholders contemplating how to reengineer the educational system.[7]

EMBRACING THE INFORMATION AGE *(Adapted from NASBE, 2001, p.13)*

Enabled by a technology-rich learning environment, an Information Age education system would be marked by:

- A focus on learning, not schools
- Learning organizations defined by mission, not by geography and facilities
- Student-focused, customized learning, not mass-produced, one-size-fits-all instruction
- Self-directed and holistic learning, not regimented recitation
- Learning on a 24X7 basis and throughout the year, not on artificial schedules and calendars
- Empowerment of families and educators, not bureaucracies
- A number of options and educational providers for each student, not a standard model for all

Digital Distance Education

One of the first applications for DDE (Kearsley, 1998) was in the business sector as a method to increase efficiency in training.[8] In the business sector, communication *speed* is the driver fueling technological research and investment (Perez, interview 2002;[9] Kearsley 1998). However, this investment in information technology has not necessarily been profit-driven. Kearsley found that for the business sector, savings are offset by the investment needed on the technology, training expenses and the course design. For businesses, many other issues beyond costs associated with e-learning weigh into investment considerations. This reflects how compelling the adoption of these communication systems has been.

The most fundamental definition of distance education is "a form of education in which students are separated from their instructors in time and /or space" (Copyright Office, 1999: ii). In the United States today, DDE is a burgeoning field. DDE technologies have fostered rapid expansion in the populations being served, institutions that impart it and partnerships they have developed.

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[5] See Clark (2000) in Appendices I and J for more information.

[6] Between 2000 and 2001, there was an 83% increase in the number of students enrolled in at least one distance learning course and a 59% increase in the number of Internet-based or Internet and mixed media courses completed.

[7] NASBE's Any Time, Any Place, Any Path, Any Pace (2000) calls for "reengineering the system" to assure delivery of high-quality instruction to all e-learners and outlines (1) revising standards, (2) enhancing state assessment on line, (3) streamlining policy, (4) empowering users and (5) adjusting beyond geographic boundaries.

[8] See Distance Education Goes Mainstream.

[9] See also Appendix J.

Today, DDE in some form or measure is already integrated into the educational spectrum, with its most extensive use occurring in higher education.[10] Advanced information technologies' capabilities allow students an interactive experience that parallels face-to-face teaching, in effect creating a virtual classroom (Copyright Office, 1999)."[11] In the past few years, adjustments to media changes have made courses[12] more convenient and more cost-accessible,[13] resulting in the proliferation of computer-based instructional media in everyday educational practices. Because of the versatility of these information technology systems, practices remain largely customized by user needs.

The Copyright Office report finds that "there is no 'typical' digital distance education course (1999, p. iv)."This finding also extends to the virtual high school environment. Instructors may build courses from scratch or, more often than not, customize commercial software.[14]They may combine various techniques such as e-mail, threaded discussions, chat rooms, whiteboard programs, shared applications, streamlined video or audio and interactive CD-ROMs.

AP and the Electronic Classroom Technology

Internet-based communication technologies have already revolutionized many aspects of our daily experience, with some of the most important spin-offs located in the educational realm. More and more classes are taking place in "electronic classrooms" where the presence of a computer supports instructional delivery.

> ...One interesting sign of transition from traditional teaching to distance education is the increasing popularity of electronic classrooms. At schools, colleges and training centers around the country, we are seeing the rapid build-up of classrooms full of computer equipment, most of it fully networked with large screen displays for group viewing.The instructor workstation can be used to display multimedia materials for the class as well as to access individual student workstations. Students can interact with each other during class using groupware programs. These systems are a transition to distance education because they get everyone (students and faculty) used to technology-mediated instruction; and it is a relatively small step to continue the instructional activities using the same technology located at home or the office. The only step then, to full-on distance education, is the elimination of the physical presence of students and teacher in the same location (Kearsley, 1998).[15]

Students entering college are already familiar with the Internet and are *expected* to understand how to use these media as part of their educational work. Teachers and teacher assistants are also expected to take advantage of these systems. In higher education, multi-media classrooms are usually accessible, publishing houses develop teacher supports accessible through the Internet, students post their assignments online, and do their research online and sometimes students take assessments online as part of a regular classroom environment.

Higher educational institutions offering DDE draw on library resources that increasingly offer more digital services. This entails training faculty and staff to teach digital courses and to be proficient users of the media. As students increase their use, the demand for digital services increases, encouraging further development by educational technology service providers. The pace of this cycle continues to accelerate as these synergic processes stimulate the economy and fuel expansion (Copyright Office, 1999, p. iii).

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[10] While higher education DDE is different than its K-12 application, higher education has had a longer history with DDE. This literature review focuses on higher education where it is relevant to K-12 environments.

[11] http://www.loc.gov/copyright/docs/de_rprt.pdf

[12] This may include synchronous and asynchronous methods.

[13] See McClanahan's Virtual Learning: The State of the Nation and the State of the State and Appendix H for a gamut of approaches to the organization of e-learning at the post-secondary stage.

[14] See "The State of Virtual High Schools" section below.

[15] Kearsley, Greg. Distance Education Goes Mainstream. (1998) T.H.E. Journal Online: Technological Horizons in Education. http://www.thejournal.com/magazine/vault/A3396A.cfm, accessed 2/9/2002. The Copyright Office (1999, p. iii) sees that distance education is reaching wider audiences and covering all segments of the population. However, it notes that the higher education audience is particularly responsive to this technology as it serves the needs of an older, nontraditional, flexible learner population and students across different countries. Widespread business use of information technology and DDE and the increased flexibility of nontraditional instructional delivery methods are also forcing traditional schools to shift to other models.

The higher education digital classroom culture has driven the transformation of the high school educational environment through AP courses. Many of the virtual courses offered today in virtual high schools (VHSs) are designed for AP. In cases where universities are involved in the support of AP courses, high school students are expected to interact with university faculty members using various digital media. Clark (2000, p. 16) identified AP courses as having been one of the key forces driving the interests of virtual high school initiatives (the other driver identified by Clark is equitable access).

The State of Virtual High Schools (VHSs)

E-learning providers, virtual charter schools and virtual high schools are sprouting up across the nation to service the virtual high school instructional, information technology and virtual program needs. The *Technology to Improve Texas Education* report states that "Texas must act now to refine goals to redirect resources (toward e-learning), or the opportunity for a brighter future through education will fade (CORD and Concord Consortium, 2000)."[16]

Clark in *Virtual High Schools: The State of the States* (2000) defines a statewide virtual high school (SVHS) as a state-approved or regionally accredited school that offers secondary courses for-credit through distance learning methods that include Internet-based delivery. In 2001, Clark refined this definition to an educational organization that offers K-12 courses through Internet- or Web-based methods. Clark's 2001 report analyzed and summarized characteristics of SVHSs in Florida, Michigan, Kentucky, New Mexico and Utah. The table below summarizes key structural patterns at eight development levels, including Technology, Funding, Curriculum, Student Services, Professional Development, Assessment, Policy & Administration and Marketing & Public Relations.[17]

Virtual High School Characteristics

Technology	Experimentation underway with various Web-based learning platforms. Unique state issues related to enrollment capacities sought, in-house technical resources, partnerships, likely teacher and user characteristics, etc., are factors in choice of delivery software. "One stop" access to courses is offered with a variety of media within a statewide technology system.
Funding	Most states are combining funding through a state agency with tuition. Barter models are seeking annual fees from affiliated districts, which have a local impact similar to tuition. Alternative funding structures are not readily apparent. Sustainability concerns are key to many systems.
Curriculum	Curricula offered by SVHS are mainly supplemental to regular instruction, but most will offer alternative diploma options eventually. Wide range of courses is available, most not aligned to state or College Board standards.
Student Services	Wide range in student services. Some rely on districts altogether while others have a (usually state-level) centralized approach. Some offer virtual library access, online counseling and other virtual services where others arrange in-person services.
Professional Development	Leading schools are taking different approaches, ranging from extensive online training to extensive in-person training, using both in-house and vendor capabilities. No single clear model has emerged.
Assessment	Two largest stand -alone SVHSs have extensive Internet and external assessment structures.
Policy & Administration	Clear arrangements and commitments between the various parties involved in administrative services are apparent in most successful models. Some excellent policy examples are available from leading models.
Marketing & Public Relations	Major models all have fairly sophisticated approaches to marketing their offerings to potential users and disseminating information to key stakeholders and opinion leaders.

(Adapted from: Clark, 2000, p. ii)

[16] As mentioned in Footnote 4 above, this report was not focused on K-12 environments but its research offers valuable support of virtual program development. See Appendix F for benchmarks and a summary of the report in Appendix K.

[17] This survey of the literature shows that these findings on the status of virtual high schools are, in general, still pertinent in the development of e-learning educational enterprises. As mentioned in Footnote 2 above, Clark's 2000 research informed the 2001 TEA summary by McClanahan. The summary recommendations are endorsed herein and are presented in more detail in the policy section.

For this literature review, Clark's sites were revisited. A summary of characteristics based on his categories is presented below and includes Web-based information for the following high schools: Alabama, Arkansas, Florida, Hawaii, Illinois, Kentucky, Louisiana, Michigan, North Dakota, Utah, WestVirginia, California Choice 2000, Cyber schools, Concord, Maryland Virtual School of Science and Math and APEX.[18]

- *Technology*—Systems continue to be largely Internet-based, offering online courses. A few specify access to computer labs in local high school labs. A majority seek to become a "one stop" Internet programs. Many offer an on-site coordinator and technical support.
- *Funding*—Of those who specified a funding organization, the majority combine state funding and tuition. A few are managed by service providers (like APEX), who develop the content and software delivery packages. These are paid back by the district that registers the student. Alternative funding strategies to this one are not apparent.
- *Curriculum*—As Clark (2000) finds, the majority ofVHSs curricula are advanced placement (AP) driven. A majority now offer credits for required high school courses.
- *Student Services*—Online chatrooms and e-mail teacher instruction are the main communication platform for VHSs. Many districts are asked to have computer labs that support access by students. Many offer on-site coordinators and have curriculum counselors also available at the local high school.
- *Professional Development*—Currently little focus on staff development. Service providers do specify that they offer teacher support and training. Most sites mention that teachers are state certified but there is little mention as to how and if teachers are specifically trained and or certified in distance education.
- *Assessment*—The majority of strategies to ensure student identity entail local high school registration and taking end-of-course exams in person to receive credit. The majority register students at a local high school and the district enters students' grades.
- *Policy & Administration*—The majority have clear and explicit agreements between the various parties involved (state, district, state VHS and service providers).
- *Marketing & Public Relations*—No clear apparent partnerships with businesses or universities have been established to date. A few mention partnerships with technical, business, or educational publishing consortia.

In Clark's 2001 report, he notes the trend from "virtual high schools" to "virtual K-12 schools" is continuing. He estimates that between 40,000 and 50,000 students were served by an online course in 2001-02 and that at least 14 states have planned or operational state-sanctioned, state-level virtual schools in place.

Organizational Diversity and Consensus

The table offered in the following pages summarizes characteristics of the above-mentioned high schools. The table is based on their marketing web pages, so the information is not consistent across these fundamental categories. The table also shows great variation in the focus and organizational approaches to these schools. The following are more common emergent models:

- *Access*—High schools that offer virtual courses reflect great organizational complexity and a great diversity in approaches to ensuring access. One approach is having a computer lab in the local high school to support student access with technical support. Not all of high schools offer this.
- *Policy*—Most of the SVHS are managed by state policy focusing on: equal access, curriculum alignment, and security in registration and enrollment. These are all key areas of accountability.
- *Technology, funding and curriculum*—A majority of SVHSs are online-based instruction programs that offer required high school courses and AP credits. They are partially funded by the state and also subsidized with district tuition pay. A majority enroll students in local high schools and pay is routed from the district to the service provider or the SVHS.

[18] All web sites were accessed between December of 2001 and March of 2002. The information used by Clark (and McClanahan) was based on Florida, Illinois, Kentucky, Michigan, New Mexico, Utah, Concord and for-profit Class.com. Please see the Summary of Virtual High School Characteristics table below for more detail.

- *Student identity*—Registration at local district high schools ensures student identity and also secures funding. Assessment for these courses requires end-of-course exams to be taken in person to ensure student identity.
- *Student services, professional development, public relations*—These areas seem to have no clear emergent model as yet.

The above areas of agreement suggest that Clark's finding on e-learning key drivers remains relevant, "Key forces driving state interest in virtual high schools include federal, state and local roles and initiatives, equitable access and AP" (2000, p. 16).

The Peake Group's national survey, *Virtual Schools Across America: Trends in K-12 Online Education 2002*, classifies a school or program as a virtual school if online delivery (via the Internet) is the primary delivery method and if the audience reached by the school or program is broader than the traditional day school audience. Additional characteristics are accreditation or close affiliation with an accredited organization and mechanisms whereby students can receive credit from the virtual school or from their local school.[19]

[19] Results of the Peake Group survey are available at http://www.peakgroup.net.

Summary of Virtual High School Characteristics[20]

High School	Technological Platform & Support	Finance	Curriculum Objectives	Student Services & Opportunities	Professional Development & Teacher Certification[21]	Policy & Administration	Public Relations & Business Partners
Alabama	Internet-based modem; site coordinator is teacher aide		AP	Site Coordinator access	Certified teachers	Courses approved by Alabama state department of education (SDE)	
Arkansas	Online instruction; Internet-based	Pilot stage; grant supported; co-op organization	Assist students in completed coursework	Students tested with end-of-course exam; grades sent to national office with transcript to local high school		Goal is to offer flexibility to help graduating students	
Florida	Online instruction; Internet-based; e-mail; chat rooms		60 courses	Diplomas offered via local high school	Opportunity for teachers to learn technical skills; certified teachers		IBM & various educational publishing houses
Hawaii	Managed by Advanced Technology Research; oversees research, strategic plan, program resources in affiliation with local schools				Certified teachers		
Illinois	Online instruction; Internet-based; high school provides computer lab access for teachers and students; also provides on-site coordinator	Combined federal and state; district pays Illinois virtual high school (VHS) for student enrollment	Offer student credit	Curriculum counselor; local high school registration to ensure student identity; 25-30 students per teacher/section	Certified teachers	Goal is to ensure student success; must possess Illinois State Board of Education (SBE) recognition to operate at Grade 6-12 level	
Kentucky	Content delivered to KVHS through Kentucky Education Technology Systems; online instruction; Internet-based	Managed by Kentucky SDE; school district pays fee to KVHS	KSDE aligned curricula	Student can take course from any location any time, 24X7 course access; enrolled through local high school; credit obtained thru local high school; 25-30 student max per teacher/ section; final exam in person at local high	Certified teachers	To offer flexibility and ensure success	

[20] The information contained herein is web site-based. Cells that have no information reflect the content base of these pages. All web sites were accessed in January and February of 2002.

[21] Unless specified, teacher certification is regular state teacher certification, e.g., certification not targeted to e-learning.

High School	Technological Platform & Support	Finance	Curriculum Objectives	Student Services & Opportunities	Professional Development & Teacher Certification[21]	Policy & Administration	Public Relations & Business Partners
Louisiana	Hosted by APEX Learning; part of statewide distribution learning network; Internet, satellite and compressed video; schools are expected to provide on-site coordinator and computer labs	AP incentive State paid (LSDE) funding for low income students available	AP courses; high school credit in math and science; Apex content	On-site coordinator and labs	Certified Teachers		
Michigan	Online instruction; Internet-based	VHS district has the capacity to "stretch school budgets"	High school credit courses; AP	High school credits	Certified teachers; MVHS has capacity to provide staff development	Funding to improve student performance	
North Dakota	Online instruction; Internet-based; supervisor approves grades		Offers all required high school courses; moving toward K-12 curriculum	North Dakota Independent Study (NDIS) requires final tests supervisor; grades need only NDIS approval from supervisor			
Utah	Online instruction; Internet-based		Courses offered include Language Arts, Healthy Lifestyles and Social Science	Web-based registration			
West Virginia	Online instruction; Internet-based		Required high school courses and AP high-quality courses, enrichment, elective, plus remediation				IBM support
California Choice 2000	Online-based; synchronous sessions	Only San Bernardino, San Diego, Imperial and Orange County students accepted; worldwide students pay separate fees					

[21] Unless specified, teacher certification is regular state teacher certification, e.g., certification not targeted to e-learning.

High School	Technological Platform & Support	Finance	Curriculum Objectives	Student Services & Opportunities	Professional Development & Teacher Certification[21]	Policy & Administration	Public Relations & Business Partners
Cyber-schools			Enrichment, AP statistics, motivated science students				
Concord		US Department of Education nonprofit	Math and Science AP	Schools participate offering classes; faculty is composed in this way			
Maryland Virtual School of Science and Math	Online-based	Teachers obtained National Science Foundation original funding for project where students were learning from scientists in the field	AP computational modeling course	On-site high school availability			
APEX	Online-based delivery of content	For-profit; district-based contract					

[21] Unless specified, teacher certification is regular state teacher certification, e.g., certification not targeted to e-learning.

e-learning Practice Principles and Policy Development Key Areas

Despite the variation in virtual program organization, effective practices have been identified. The Policy Lab Leadership Group of Southern Regional Education Board (SREB)[22] has created the following set of principles to support the organization of virtual educational programs. The following set of principles of good practices identifies key areas of development for the operation of successful virtual educational programs. The areas identified by the SREB are: Curriculum & Instruction and Institutional Context & Commitment. Under the latter area are: Role and Mission, Commitment to Support, Students & Student Services. Faculty Support, Evalution & Assessment and Resources for Learning.

Southern Regional Education Board
Principles of Good Practice for Electronic Campuses

Curriculum ... Instruction	Institutional Context and Commitment		
I. Each program or course of study results in learning appropriate to the rigor and breadth of the degree or certificate awarded. II. A degree or certificate program/ course offered electronically is coherent and complete. III. The course/ program provides appropriate faculty-students and among student interaction. Qualified faculty provide appropriate supervision of the program/course offered electronically. Academic standards for all programs/ courses offered electronically are the same as those for other courses/ programs delivered at the institution where they originate. Student learning in programs or courses delivered electronically should be comparable to student learning in programs or courses offered at the campus where they originate.	**Role and Mission** I. The program/ course is consistent with the institution's role and mission. II. Review and approval processes ensure the appropriateness of the technology used to meet program/ course objectives. **Commitment to Support** III. Policies for faculty evaluation include appropriate teaching and scholarly activities' recognition of programs/ courses offered electronically. The institution demonstrates a commitment to ongoing support, both financial and technical, & to continuation of the program or course for a period sufficient for students to complete a degree or certificate. **Evaluation & Assessment** I. The institution evaluates program/ course effectiveness, including assessments of student learning, retention, ... student/ faculty satisfaction. The institution provides for assessment and documentation of student achievement after program/ course completion. Program/course ... e-catalog have appropriate information.	**Students and Student Services** I. The program or course provides students with clear, complete and timely information on the curriculum, course and degree requirements, nature of faculty/ student interaction, prerequisite technology competencies and skills, technical equipment requirements, availability of academic support services, financial aid resources and costs and payment policies. II. Enrolled students have reasonable ... adequate access to student services and resources appropriate to support e-learning. III. The institution has admission/ acceptance criteria to assess if student has the required knowledge ... technical skills to undertake the course/ program. Advertising, admission, recruiting materials clearly ... accurately represent available program ... services.	**Faculty Support** The program or course: I. provides faculty support services specifically related to teaching via an electronic system. II. provides faculty with adequate equipment, software and communications for interaction with students, institutions and other faculty. III. The institution ensures appropriate training for faculty who teach using technology. **Resources for Learning** The program/course: I. ensures availability of adequate learning resources. Evaluates the adequacy of access to learning resources & the cost to students for access to these. It also documents the use of electronic resources.

Adapted from: SREB principles http://www.electroniccampus.org/student/srecinfo/publications/principles.asp

[22] Summaries of various initiatives are at http://www.electroniccampus.org/policylab/docs/initiatives.asp.

These standards, though developed for higher education, can serve to plan other e-learning programs. SREB's electronic campus study identified the following priority policy development areas:[23]

- Finance (revising traditional funding models)
- Faculty (assessment, capacity building, intellectual property, reward structures, training, technical support and professional development)
- Student (credit transfer, services, distance learner services, identity and security)
- Tuition differentials between in-state and out-of-state students
- Quality assurance
- Financial aid for distance learners
- Reaching underserved populations
- Coherence and values in distance learning

Virtual public schools have unique priority needs. Clark, in *Virtual High Schools: The State of the States* (2000), synthesized eight development categories to focus on when developing e-learning programs.[24] In terms of policy actions, the *Technology to Improve Texas Education* report prioritizes professional development, Web-based content and tools, hardware (connectivity and technical support) and accountability.[25] The impact of information technology on virtual programs is profound, requiring policy support in all these arenas of public education. Efforts to plan and regulate communication and the educational, human resources and technological aspects of e-learning must take the complexity of virtual high schools' (VHS) organizational structures into account.

In a recent report entitled *Are We There Yet?*, researchers surveyed technology decision-makers from more than 800 school districts. About one-third of the respondents predicted that at least 20% of students will receive roughly one-third of their instruction via the Internet within the coming few years. The report also identified several policy concerns such as verification of attendance, equity and accommodation for special education students, proper handling of transfer students and credits earned, high dropout rates and accommodating mandated "seat time" and state attendance requirements.

NASBE's e-learning study group report (2001) *Any Time Any Place, Any Path, Any Pace: Taking the Lead on e-learning Policy*, found that e-learning is rapidly transforming the life of schools, including how and what students learn, the very concept of school, the teacher-student relationship and pedagogy itself. They concluded that e-learning will improve American education and should be universally implemented as soon as possible. Policy leaders are asked to seize the opportunity to promote e-learning and to assure that it spreads rapidly and equitably.

The NASBE report calls for a complete restructuring of the educational system. To reengineer the system, the NASBE study recommends the following essential steps: a.) The revision of standards; b.) Online state assessment; c.) Streamlining policy for effective administration of e-learning; d.) Empowering the choices of families and student; and e.) Adjusting beyond geographic boundaries.

To ensure equity, this study recommends: a.) Ensuring high-quality educators for all students; b.) Providing access to robust equipment and in-school Internet access; c.) After-school Internet access; and d.) Supplying students with special needs appropriate access to these technologies. In terms of delivering high quality instruction to all learners, this group recommends: a.) Offering online courses for-credit; b.) Providing high-quality e-learning courses; and c.) Protection in terms of student use of the Internet, privacy and advertisement.

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[23] For more on this SREB effort, see Appendix G for SREB's electronic campus policy lab and the policy related section of Appendix K. See also the ETCC's State of Texas Master Plan for Educational Technology 2002-2003 in the policy related section of Appendix K.

[24] See Clark's recommendations for SVHS planning listed below.

[25] This report also developed benchmarks and actions for on the above areas. See Appendix K for more detail.

Recommendations for SVHS Planning

Technology	Consider all technology options in relation to likely needs over the next two years and think strategically and flexibly about technology over time. "One stop" access to a variety of technologies should be considered to maximize return on the state's educational technology investments.
Funding	Consider funding implications early on, including cost/ benefit to local districts for participating and seek to identify as early as possible the most sustainable funding mechanism in your state.
Curriculum	In deciding on course licensing and course development parameters, consider the main purpose of your curriculum in terms of state specific needs and the likelihood of future external course sharing.
Student Services	Form alliances to provide student services and involve local districts in decisions about the extent of local responsibilities.
Professional Development	Consider a mix of methods for providing teacher training, leveraging existing resources wherever possible and creating incentives for participation.
Access/ Equity	Prioritize the access/ equity concerns most relevant to your state. Create strategies for reaching at-risk populations and providing AP access.
Assessment	Create an internal formative assessment structure and use external evaluation with reports timed to fit the state legislative cycle.
Policy & Administration	Adopt and adapt from existing SVHS policies and procedures while seeking to ensure a good fit with unique state circumstances.
Marketing & Public Relations	Develop a comprehensive marketing strategy, working collaboratively with partners, including enrollment strategies for users and public relations strategies for stakeholders, funding partners and opinion leaders, while working to keep expectations in line with achievable goals.

Adapted from: Clark, 2000, p. iii

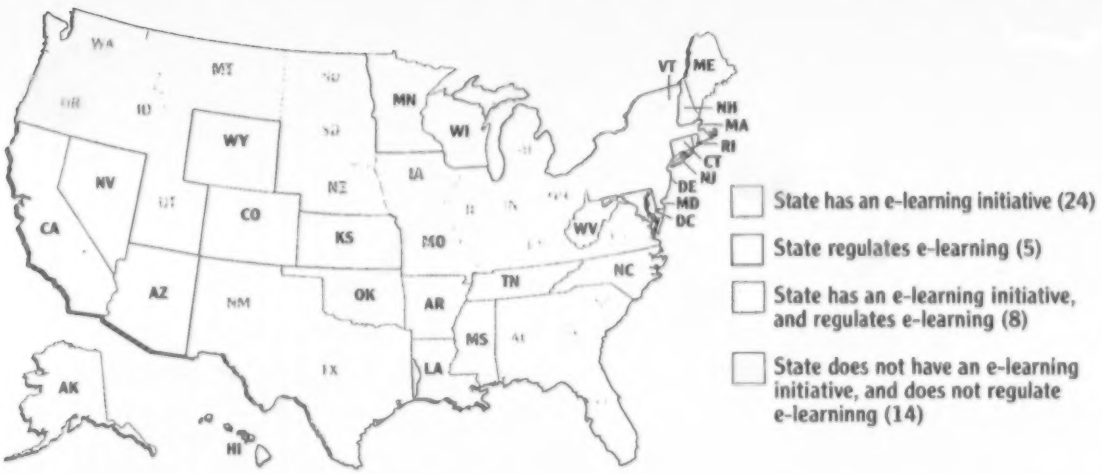
Of the above, the surveyed literature emphasizes capacity building processes, assuring equal access/high quality for virtual schools, funding and developing accountability measures.

An *Education Week Online* article (May 2002) explores the findings in *A Survey of State Technology Coordinators* and reports that the virtual high school bandwagon is comprised of "12 states that have established online high school programs and five others [that] are developing them, 25 states [that] allow for the creation of so-called cyber charter schools and 32 states [that] have e-learning initiatives under way."[26] This report confidently states that e-learning is the wave of the future because "after all, this new way of delivering education has the support of numerous state and local policymakers, education researchers and business leaders."[27]

[26] For the article's full-text, go to http://www.edweek.org/sreports/tc02/tables/35edefining-t1.h21. For more information on virtual high schools state profiles and links, go to http://www.edweek.org/sreports/tc02/35profiles_map.htm.

[27] Education Week Online. E-defining distance education, Vol. 21, number 35, May 9, 2002 at http://www.edweek.org/sreports/tc02/35profiles map.htm.

The same article also reports that, "Currently, 32 states sponsor e-learning initiatives and 13 regulate private e-learning initiatives that are not operated by the state. State e-learning programs include online assessments, virtual schools or training for online educators. State efforts to regulate independently-provided e-learning efforts include requiring that programs meet state standards, or that online teachers are certified."[28]



State Initiatives on Assessment and Accountability

The Web-based Education Commission to the President and Congress of the United States (2000, p. 75) finds that K-12 online courses follow the model of traditional education assessment. The courses are certified by the home state or regional accrediting body with jurisdiction in that state.

Assessment requirements, teacher credentialing and the granting of credits are all areas under individual state policy. This means that an e-learning institution will have to deal with various accreditation standards from state to state.

Bennett (2001) finds that online assessment will revolutionize current practices. The NASBE study (2001) urges all stakeholders and leaders to devote resources to develop and implement online assessment as soon as is possible. However, the Web-based Education Commission to the President and Congress of the United States (2000) recommends further research to understand and the legal shifts necessary to adjust to this new Web-based assessment process.

Leaders in the educational field, policymakers, stakeholders and educators will have to readjust to the new possibilities arising from this increased flexibility. The advantages of the increased flexibility and reach are offset by the increased organizational complexity and by initial investment costs.[29]

The literature suggests that statewide implementation of policies for credentialing Web-based education, courses, teachers, credits/ assessments and content will resolve the issues of accountability (Pennsylvania School Boards Association, 2001).

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[28] Education Week Online. E-defining distance education, Vol. 21, number 35, May 9, 2002 at http://www.edweek.org/sreports/tc02/article.cfm?slug=35execsum.h21.

[29] As discussed above, costs have not kept these technologies from proliferating in either the business or university sectors. Clark (2000) also does not identify costs as a major obstruction to the enhancement of e-learning technologies in SVHSs. Increases in market demand have driven prices of infrastructure technology down and it is foreseeable that this will be the case long-term.

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Financing e-learning

Carr's (2001) InformationTechnology article in the Chronicle for Higher Education Online asks *Is Anyone Making Money on Distance Education?*[30] She reports that colleges are struggling to discern how much they are spending on online programs because of the complexity of operations. Carr reports that these programs are now starting to break even after many years of investment and operation. "The reports do suggest that those who assumed it would be possible to create new sources of revenue from online programs quickly—or even to sustain the programs without financial scrutiny—will be disappointed." Sustainability of these systems is a serious question that investors consider integral in their design.

The Pros and Cons of Investing

The literature is overwhelmingly positive and optimistic about the benefits of e-learning. Among the benefits listed are e-learning's enhanced capacity to reach immigrant students (Civic.com, 2001), enrich pedagogical and educational quality and math and science curricula (Angrist and Lavy, 2001; Eisenhower National Clearinghouse, 2001; Verona, 2001), foster student-centered education (McNulty, 2002; Sack, 2001), revolutionize assessment with online delivery (Benett, 2001) and increase flexibility and enrich home schooling (Reston, 2001).

Yet, many observers are skeptical of these claims for e-learning. Many feel that technology is not yet optimized and that it is too early to understand its cultural and social effects on children. Objections raised against the fast proliferation of these systems include issues such as funding jurisdiction (Hardy, 2001), tracking students (Trotter, 2001), differential quality and quantity of instruction (Sanford, 2001), taking time to retrofit teaching programs and support teachers in making the transition to new technologies (Rodes, et. al., 2000), quality of instruction issues (American Federation of Teachers, 2001) and the new stresses involved and the possibilities of burn-out for both students and teachers (Bates, 2000; Noriko & Kling, 2001). All of these concerns remain important matters for research and their consequences are yet to be fully comprehended.

Costs

NASBE's study group recognizes that the main initial costs for these changes lie in: 1.) Investment in the new technologies; and 2.) Capacity building for teachers. Even more fundamentally, studies have focused on the lack of standard financial categories with which to report and assess these costs. For this purpose, the SREB's Distance Learning Policy Laboratory has established a series of financial initiatives. The lab recommends that better design and measurement of the financial costs of distance education be prioritized. With this purpose, the Technology Costing Methodology project was created.[31] Their findings are:

> Many institutional leaders and policy makers do not have a solid base of information on which to make financial decisions about distance learning. While distance learning changes the fundamental nature of how colleges and universities conduct business, traditional budgeting schemes (tuition and fee structures, formula-based funding, cost recovery, capital budgets and depreciation) persist. Many of these policies are not relevant for the emerging learning environment. In most public educational systems, for example, there is a dedicated revenue stream to support building programs; this means that funding budgeted towards construction can only be spent for construction.
>
> Funding sources are typically imbedded in law or regulations which limit spending in other areas such as technology infrastructure upgrades or equipment purchases. Distance education, if it is to become a legitimate portion of an institution's enrollment plan, will require less brick and mortar and the availability of more capital resources for other categories. Flexibility and authority to disperse allocated funding according to individual campus needs is required. Changing long-standing approaches to funding policy will be difficult and challenging, but it is also critical to the future development of distance learning.[32]

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[30] February 16, 2001. http://chronicle.com/free/v47/i23/23a04101.htm

[31] The SREB has obtained a grant from the U.S. Department of Education's Fund for the Improvement of Post-secondary Education for this purpose. Please see the additional resources section for more details or go to http://www.wiche.edu/wcet/projects/tcm/.

[32] See http://www.electroniccampus.org/policylab/docs/Issues/finance.asp. See also Appendix G for more details on SREB's current research initiatives.

Infrastructure Cost Factors

University of Idaho's (2001) *Distance Education at a Glance*[33] is a valuable model for understanding the layers of costs involved in creating the infrastructure and sustaining a DDE program. They suggest that the first consideration for creating a DDE program is its cost. Cost components that weigh into the design of DDE systems are:[34]

1. Technology - hardware (e.g., videotape players, cameras) and software (e.g., computer programs)
2. Transmission - the ongoing expense of leasing transmission access (e.g., T1, satellite, microwave)
3. Maintenance - repairing and updating equipment
4. Infrastructure - the foundational network and telecommunications infrastructure located at the originating and receiving campuses
5. Production - technological and personnel support required to develop and adapt teaching materials
6. Support - miscellaneous expenses needed to ensure the system works successfully, including administrative costs, registration, advising/counseling, local support costs, facilities and overhead costs
7. Personnel - to staff all functions above

The financial categories above reflect the incremental costs in the management of infrastructure networks.[35]

The basic costs of a LAN lie in its physical connectivity, e.g., cabling, routers and servers. At this level, connectivity costs are reasonably low today ($100- $200 US per port). The cost categories described above and human resources are what make information technology delivery systems expensive. Nonetheless, research suggests that as programs become more efficient, program costs will decrease, thus increasing delivery capacity and perhaps increasing revenue. These long term processes make the investments potentially self-sustainable in the long-term.

The University of Idaho (2001) research found that traditional and conventional courses' costs are high and suggest that it is worth taking the first steps to shift investment toward distance education programs. According to their research, depending on the institutional needs, the benefits may outweigh the initial costs. Among the benefits of distance education courses to students they include:[36]

1. Accessible training to students in rural areas
2. Students may complete their course of study without suffering the loss of salary due to relocation and class hour inflexibility
3. Students are exposed to the expertise of the most qualified faculty

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[33] See http://www.uidaho.edu/evo/distglan.html. See also Appendix G for their research guides.

[34] The University of Idaho (2001) suggests that e-learning institutions assess whether it is part of their mission to offer programs to those who may not be reached without distance education. They also suggest that the primary benefit institutions could derive from investment in distance education may be an increased number of nontraditional students.

[35] What is considered technology for the University of Idaho is not the fundamental information technology infrastructure needed for Internet-based e-learning. All of the expenses identified above are variations on LAN-ready systems.

[36] These are expenses for what pertains to layers 5-7 in the model provided in Appendix J. Basic connectivity costs are also formulated in Appendix J. See Appendix I for an example of an evaluation instrument for an Internet-based program. The categories from the University of Idaho and from the infrastructure model in Appendix J are offered here for consideration in order to clarify cost categories for decision-makers.

Other Themes

Transformation of the Educational Reality—Scope, Reach and Vision

In the last decade, we have experienced profound changes in communication technologies. The early research on DDE (Tiffin and Rajasingham (1995), Brande (1993) and the Copyright Office (1999)) captures the phenomena of the Open University and its expansion to service populations beyond university settings. Today, DDE interests seek to expand its educational reach beyond the industrialized nations, thus networking knowledge at a global level.

The information technology revolution has affected the scope and reach of educational delivery capacities. The literature on virtual schools reveals that one central policy concern is that of ensuring equal access to students. The foremost concern in policy papers is universalizing access to e-learning. Distance learning technologies have facilitated and increased flexibility in educational opportunities and many policy statements emphasize how DDE can help reach students in nontraditional settings.

The following table (NASBE, 2001) shows how adoption of these technologies into the K-12 educational environment is changing the educational paradigm as well.

Questions that assume the current education system	**Questions that do not assume the current education system**
How can computers improve schools?	How can new technologies enhance learning wherever it happens?
How is today's technology best used in the classroom?	How might emerging types of networked digital computers and digital devices be harnessed to enhance learning?
What are the best ways to help all students equally master the standard curriculum?	How do we support mass customization that fits individual sets of interests, strengths and needs?
How can online courses be made to fit within the school schedule and calendar?	How can education leaders assure that students have access to every learning opportunity they need?
How can K-12 teachers (and teachers of teachers) learn to use technology to enhance their lesson plans?	How can teachers learn to be fellow learners along with their students, in a way that everyone teaches each other and learns from one another?
How can we motivate educators to use existing research findings as well?	How can we motivate educators to use research and also become pioneers who themselves create and share new knowledge?

Source: NASBE, 2001, p. 15

Fast Paced Change

Despite the urgent messages to devote resources to the implementation of e-learning across the board, the need for time to adjust to these fast paced changes remains. Administrators, teachers and students need time and support to successfully transition into these new technology-based processes. Staff development and teacher training and support are policy development areas that remain unclear perhaps because of costs involved.

Transparency

With the increased flexibility that DDE offers, the issue of quality control and transparency cannot be overlooked. These are very important for user and consumers confidence (Western Cooperative for Educational Telecommunications, 1997). Institutions providing e-learning services must have clear and concise contracts defining expectations, obligations and privileges for parents and students.

Students

The kind of student that is successful with Web-based technologies today is "self-selected" (University of Idaho, 2001). These students tend to be technology/computer savvy, comfortable with independent research and tend to exhibit the initiative to communicate with teachers. Careful needs assessment research on "remote" and rural locations on student computer facilities and abilities (for example, among immigrant populations) must take place before investment in DDE systems take place.[37]

Teacher Professional Development

Another important theme is that of retraining and preparing certified teachers in this new technological milieu. According to the *Texas Public School Technology Infrastructure and Implementation Survey 2000*, Texas teachers on average are becoming comfortable with computer basics but do not effectively integrate information technology into teaching (CORD and Concord Consortium, 2000). The table presented below shows the percentages of Texas districts reporting on teacher technology use.

Table 2. Selected Responses from the *2000 Texas Public School Technology Infrastructure and Implementation Survey*

Question	% of districts reporting 0.75 to all teachers	Average %
What % of your teachers . . .		
. . . use technology productivity software?	53%	—
. . . use instructional software in support of the TEKS?	18%	—
. . . use the Internet for e-mail/online forums?	57%	—
. . . use the Internet for accessing Web-based curricula?	9%	—
. . . use the Internet for collaborative learning projects?	2%	—
. . . use the Internet for research?	22%	—
. . . have integrated technology into their teaching?	—	16%
. . . are just beginning to learn technology applications?	—	12%
. . . know the basics and use computers for e-mail?	—	37%
. . . are beginning to use the Internet for instruction?	—	25%
. . . are using online resources and using Internet tools in student assignments?	—	18%

(Source CORD and Concord Consortium, 2000: 18)

It seems clear that teacher training and professional development in these fields need to be evaluated further. Gehring (2002) reports that eventually, "online learning will catch on at most secondary schools as teachers and administrators become more comfortable with a medium that their students have long been using."[38]

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[37] Doherty, Kathryn, M. Students Speak Out in Education Week Online, May 9, Vol. 21, (35), pp. 19, 20, 22-24 (2002). Or go to http://www.edweek.org/sreports/tc02/article.cfm?slug=35florida.h21.

[38] John Gehring, Higher Ed.'s Online Odyssey in Education Week Online, E-defining Education issues link, May 9, 2002, Vol. 21 (35), pp 27-29. Or go to http://www.edweek.org/sreports/tc02/article.cfm?slug=35highered.h21.

A Final Note—The e-learning Challenge

TEXAS SIZED CHALLENGES

I. Texas has a relatively high proportion of small and rural school districts.
II. Texas is huge and populous; consequently, problems stemming from socioeconomic, demographic and other factors can affect very large–and rapidly growing–numbers of students.
III. Disparities in academic achievement caused by socioeconomic differences.
IV. High dropout rates for minorities.
V. The "digital divide"–statistics show a widespread income-based disparity in technology availability and Internet access. A comparable gap is evident in schools. NCES data published in February 2000 indicate that, as of fall 1999, 95% of American *schools* had Internet access, but disparities persisted with regard to Internet access in *instructional rooms and* the types of Internet connection used.
- The average ratio of students to Internet-connected devices is still much too high.
- There is also a "divide" in how information technology is *used*.
VI. Because of its location and agricultural focus, Texas has a large population of migrant and limited-English-proficient (LEP) students.
VII. Texas, like the nation as a whole, urgently needs more certified teachers.

Source CORD and Concord Consortium, 2000

This review has briefly described many challenges facing decision-makers and stakeholders regarding K-12 e-learning strategies. Differentials in local economies (income in rural and urban areas), population, ethnicity, student composition and the availability of certified teachers are all important dimensions facing statewide implementation efforts. The literature suggests that current statewide implementation efforts and policies for credentialing e-learning courses, teacher, credits/ assessments and content will resolve the issues around virtual education accountability. The current 12 SVHSs are successful models of state and VHS administrative interaction.

This literature review has also discussed the emergence of DDE in business sectors and its links to higher education delivery systems. It has explored some of the issues of building a LAN infrastructure and its potential costs. This literature review also described the state ofVHSs and the steps states have taken to support the creation of e-learning programs with integrity and accountability. It has also discussed and offered policy research recommendations for good practices on areas that need further policy development, such as supporting professional development to ensure the high quality of courses offered online. Other concerns, such as student registration and identity security models through district enrollment and in-person exam taking, were also discussed.

Virtual schools have forced stakeholders and leaders to think beyond geographic location, calling for creative and flexible solutions to this new information technology media. Perhaps the most profound impact of e-learning revealed in this literature review is the magnitude of change that traditional educational environments are facing. This change has repercussions for policy at the local, district, state and federal levels. The magnitude of transformation that e-learning entails is nothing short of "reengineering the system."

"Enrichment With Reach"

Benett's (2001) phrase captures the fundamental mission of e-learning. The literature points to the issues of finance, equity and human resource capacity building as bottom-line challenges to the e-learning program development. E-learning can be envisioned as a strategic component to keep Texas' workforce competitive in an increasingly globalized economy. It is in the context of increasing global market competition that the issue of equity remains so crucial. The issue of "the digital divide" (CORD and Concord, 2001) will need to be studied further in order to ensure equality across districts and schools.

Web-based information technologies are transforming our world in unprecedented ways. Embracing the opportunity to enhance flexibility of choice for all parents and students is an important step to take today toward a better future. The temptation to surrender to quick fixes might be great as the excitement exerts pressure on educational leaders. The directive to navigate this new educational technology landscape should be imbued with a commitment to select, evaluate and refine best practices that ensure success for all children in Texas.

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Appendices

Appendix A

Profiles of Individual VSP Pilot Participants

Virtual High School

Allen Independent School District 044-000-077
Allen, Texas

Allen ISD is a recognized school district located in the Dallas metroplex area. No site visit was made to the district. The district has participated in the Concord Consortium Virtual High School program since the program's inception in 1996.

District/Charter Data	
Enrollment	11,668
Attendance Rate	96.5%
Dropout Rate	0.3%
Economically Disadvantaged	5.7%
Mobility Rate	NA
Limited English Proficiency	2.2%

District/Charter Demographics	
African American	6.0%
Asian/Pacific Islander	4.1%
Hispanic	8.2%
Native American	0.8%
White	81.0%

Program Description: Allen ISD belongs to the Concord Consortium Virtual High School, a collaborative of participating high schools. For every semester a participating school offers a locally-developed VHS NetCourse, the school can enroll up to 20 students in VHS courses. A limited number of student-only schools are allowed to enroll 10 students per semester on a trial basis over one year; after the completion of a year, the school must train a teacher and join VHS as a fully participating school in order to continue participation in the program. Students select courses they wish to enroll in and register locally. The site coordinator enrolls students, sets up class and serves as liaison to the Consortium.

Targeted Students: Most of the target students are regular students with some gifted and talented students. The district offers Honors and AP courses through the Virtual High School.

Selection Process: Students must complete an online survey, have two teacher recommendations, and sign a student/parent contract.

Benefits of Courses: Courses provide highly specific courses for students who like computers and work independently.

Security:

Courses Offered: Democracy in America; Constitutional Law; Current Issues in American Law and Justice; Electricity; Evolution and the Nature of Science; Preveterinary Medicine; Genes and Disease; Personal Finance; Learning to Invest; Peacemaking; Career Awareness; Military History; Vietnam War; The Holocaust; World Religions; Folklore and the Literature of Myth, Magic and Ritual; American Pop Music; Music Composition; Music Listening and Critique; Number Theory; Creating Art History; Writing and the English Sentence; 101 Ways to Write a Short Story; and Web Design and Internet Research.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	15	17	0
Grades Served	9-12	9-12	0
Students Enrolled	13	15	0
Students Completing Course	11	12	0

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Virtual High School

Allen Independent School District 044-000-077
Allen, Texas

Student Information	Program
Training Provided for Students to use hardware: Online orientation provided. **Training Provided for Students to use software:** Instructor walks student through course during the semester. **Students complete coursework:** Most work is done during the regular school day but can be completed from any computer at any time. **Time spent interacting with adults:** Very little face-to-face communication. Students with problems can e-mail the instructor or help can be obtained after school from the instructor. Student participation and progress is monitored by the site coordinator/instructor. **Residency:** All students are presently attending Allen High School as full-time students.	

Financial Information
Subscription to the Concord Consortium Virtual High School was $6,000. Allen High School also pays for a site coordinator/instructor.

Issues Surfaced	Ideas/Suggestions Offered
	❖ Important to have support person available.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Amarillo On-Line School

Amarillo Independent School District 188-901
Amarillo, Texas

Amarillo ISD is an academically acceptable district located in the Panhandle of Texas. The district began their program by offering two courses during the summer 2002 using purchased software.

District/Charter Data	
Enrollment	29,205
Attendance Rate	94.7%
Dropout Rate	0.9%
Economically Disadvantaged	52.99%
Mobility Rate	NA
Limited English Proficiency	8.1%

District/Charter Demographics	
African American	11.0%
Asian/Pacific Islander	2.6%
Hispanic	35.0%
Native American	0.2%
White	51.0%

Program Description: Amarillo ISD offered two courses, U.S. Government and Economics, during the summer 2002. The district used the Blackboard platform and Class.com for courses.

Targeted Students: Open to all district high school students, registration preference was given to seniors needing the course to graduate.

Selection Process: District used the Florida model for student selection. The selection process required students to complete an online self-assessment. In addition, counselors prescreen students by identifying skills needed to be successful in an online school environment.

Benefits of Courses: Courses provided an opportunity for students who work, have family responsibilities, need to graduate early, and/or may not fit into a regular school environment to earn needed credits.

Security:
At the required in-person orientation, a sample of student writing is electronically captured for comparison purposes. If the teacher questions a student's work, the teacher may require that one or more future assignments be completed in the presence of a proctor. The final exam is proctored and a picture ID is required. A continuous log of the students' interaction with the online school media is kept. Students log into the system using secured access under a password-controlled system. Teachers keep logs and documentation of phone conversations, instructional activities, e-mail and other electronic interactions. Over time, teachers become familiar with unique characteristics of students' interactions.

Courses Offered: U. S. Government and Economics

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	None offered	None offered	2
Grades Served			9-12
Students Enrolled			44
Students Completing Course			35

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Amarillo On-Line School

Amarillo Independent School District 188-901
Amarillo, Texas

Student Information	Program
Training Provided for Students to use hardware: Basic computer skills are a prerequisite. **Training Provided for Students to use software:** Initial orientation, online chat rooms, bulleting boards, and e-mail provided by the vendor. **Students complete coursework:** Outside of school hours. From conversations with parents and an informal survey, all students use a computer at home. Students also occasionally access course materials from the district's, public library's or relative's computers. **Time spent interacting with adults:** Interaction with teachers is estimated to be around 14 hours (this includes asynchronous interaction). **Residency:** All students must be enrolled in Amarillo ISD.	**Method used to determine compliance with TEKS:** The project director who is certified in these subjects reviewed the courses. The director checked with other Texas districts using the curriculum. Teachers also reviewed the curriculum and added other materials as needed. Approval of the district's executive team was required. **Method used to set instructional calendar:** Based upon the district's school calendar. **Qualifications/Training for staff:** Teachers applied for positions and were interviewed. Major factors in selection were their reputations as quality teachers and flexibility regarding new ideas and procedures. Technology skills were not considered beyond a "basic comfort level with technology." Selected teachers received a two-day training course on software, courseware and online methods provided by the course provider. **Evaluation of virtual courses:** Parents and students completed a post-course survey as a summative evaluation of materials, delivery and overall satisfaction with the course. Also collected were student pass/fail rates, overall average scores, and drop rates. Based on this data and other informally collected information, Amarillo ISD has decided to seek ways and means to expand online course offerings.

Financial Information
Per student/per semester cost of each course offered is $225. Amarillo ISD has set aside a limited budget from its general fund to support the online courses and expansion.

Issues Surfaced	Ideas/Suggestions Offered
❖ Finding a source of affordable, high-quality curriculum and a platform on which to deliver it. ❖ Developing a strategic plan to ensure the project is implemented properly, complete with a workable set of policies, procedures and guidelines. ❖ Current UIL rulings are in conflict with the nature of a self-paced online course.	❖ The On-Line School is in the process of working with community organizations to provide funds and in-kind donations for students needing equipment. District anticipates needing to loan computers to approximately 20% of the students at a cost of $600 per student. ❖ Funding: Fund based upon a "state average cost" for an online course if student is a full-time student. If less than a full-time student, fund these students at 1/5 of WADA for each online course completed. If student is

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Amarillo On-Line School

Amarillo Independent School District 188-901
Amarillo, Texas

Issues Surfaced	Ideas/Suggestions Offered
	not enrolled in the district, no funding and the district will charge tuition to the student. ◆ Students have access to computer labs at Amarillo College Library Distance Learning Center, which is open until 11:00 pm on weekdays and on Saturday and Sunday.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Virtual School Program

Austin Independent School District 227-901
Austin, Texas

Austin ISD is an academically acceptable district located in central Texas. The district offers electronic courses using purchased curriculum for students needing credits to graduate. The district's primary focus is to reclaim school leavers and offer them an alternative method to complete graduation requirements.

District/Charter Data	
Enrollment	77,805
Attendance Rate	93.7%
Dropout Rate	1.5%
Economically Disadvantaged	50.14%
Mobility Rate	NA
Limited English Proficiency	17.8%

District/Charter Demographics	
African American	15.0%
Asian/Pacific Islander	2.6%
Hispanic	50.0%
Native American	0.2%
White	32.0%

Program Description: Austin ISD offered 13 courses to reclaimed high school leavers using the NovaNet curriculum and record system. Students enrolled in the pilot use the same curriculum as Austin's DELTA program (Diversified Education through Leadership Technology and Academics), which has been in operation for seven years and has assisted more than 4,200+ recovered and potential dropouts to earn a high school diploma. The first VSP program was offered from January 2002 through August 2002.

Targeted Students: Open to all high school students, enrollment priority is given to teen parents and recovered dropouts.

Selection Process: Students are referred to program by school administrator. Courses are recommended by student's school counselor or registrar based on student's graduation plan.

Benefits of Courses: Self-paced, open-entry mode of instruction allows the student to accelerate course completion. Students have 24 hours, seven days a week access to online curriculum. Students have instructional support from their teacher/facilitator on an everyday basis via Internet/p-note and two hours of weekly one-on-one direct instruction.

Security:
Each student is assigned a student ID password. All final exams are administered in the presence of the teacher/facilitator. The teacher/facilitator will occasionally p-note/e-mail a student who is online in the curriculum to gather information from the student or will monitor student work from the office computer.

Courses Offered:
World Geography; U.S. Government; Economics; U.S. History; Health; Geometry; Math Models with Application; Algebra I, II; and English I, II, III, IV.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	Not in Fall Pilot	None offered	13
Grades Served			9-12
Students Enrolled			20
Students Completing Course			8

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Virtual School Program

Austin Independent School District 227-901
Austin, Texas

Student Information	Program
Training Provided for Students to use virtual system: A two-hour orientation was offered to students in a centrally located community center. A follow-up orientation was provided in the homes of the students during the first home visit by teacher/facilitator. **Students complete coursework:** Coursework is available 24 hours/7 days a week. Students use their district-loaned laptop computer to access their courses. **Time spent interacting with adults:** Teacher/facilitator meets with student in the home, job site, library, or community center twice a week. Communication is available through a variety of ways, including e-mail, p-notes, telephone and in person. **Residency:** All students must reside in the Austin ISD attendance area.	**Method used to determine compliance with TEKS:** Since1995, all courses have been reviewed for TEKS and updated to coincide with newly adopted textbooks. **Method used to set instructional calendar:** The Virtual School Program calendar was developed to have six-week attendance periods. The program ran from January 7, 2002 through August 31, 2002. **Qualifications/Training of staff:** A team composed of administrators, certified teachers, community partners, special education staff, and parents developed the program. Teachers with experience working with homebound, PRS and at-risk students were recruited. **Evaluation of virtual courses:** Currently, a district evaluator is prepared to gather data needed to complete the program evaluation. Data includes the number of students who completed courses, ethnicity of students, enrollment dates, number of hours of on task time, etc.

Financial Information
Annual program cost of $57,501; program cost per semester of $28,750; per student annual cost of $2,875; and daily rate of $311 per student.

Issues Surfaced	Ideas/Suggestions Offered
	❖ Improve PEIMS reporting through use of unique Service-ID numbers that identify electronic or virtual courses.

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Birdville Virtual School

Birdville Independent School District 220-902
Haltom City, Texas

Birdville ISD is a recognized school district located in the Dallas/Fort Worth metroplex. The district offered six courses to all students using purchased courses.

District/Charter Data	
Enrollment	21,784
Attendance Rate	95.8%
Dropout Rate	0.1%
Economically Disadvantaged	30.25%
Mobility Rate	NA
Limited English Proficiency	6.3%

District/Charter Demographics	
African American	4.7%
Asian/Pacific Islander	5.9%
Hispanic	19.0%
Native American	0.4%
White	70.0%

Program Description: Program used courses purchased from the Florida Virtual School to provide additional opportunities for students.

Targeted Students: All students.

Selection Process: Students completed an online application that included a self-assessment on the following skills: time management, comprehension, reading and writing, computer and Internet skills. A recommendation from a school counselor was also required.

Benefits of Courses: Benefits for students included flexibility in scheduling and recovery of credits.

Security: Teachers remained in close contact with students through e-mail, chat rooms and discussion boards, assignments and telephone conversations. Through these relationships, the district believed the teachers developed an understanding of the style and quality of each student's work. Biometric techniques were investigated but, due to expense and the lack of perceived need, the district chose not to use them.

Funding Method: School district used local funds to develop program. Students were charged fees per course.

Courses Offered: Algebra I; English II; Geometry; Economics; Government; and Latin I.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	5	6	4
Grades Served	7-12	7-12	7-12
Students Enrolled	11	23	29
Students Completing Course	7	11	18

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Birdville Virtual School

Birdville Independent School District 220-902
Haltom City, Texas

Student Information	Program
Training Provided for Students to use virtual system: Students attended a two-hour orientation session prior to start of the semester. Technical support with one platform was available 7 am to 7 pm. An online tutorial was also available. **Students complete coursework:** Usually on weekends and at night. **Time spent interacting with adults:** Most interaction with teachers was by e-mail. Teachers were required to speak with students and/or parents on a regular basis. Students interacted in mandatory chat sessions during the week. **Residency:** No residency requirements.	**Method used to determine compliance with TEKS:** Birdville ISD representatives aligned the courses with TEKS, as well as with the Florida Virtual School content. **Method used to set instructional calendar:** For the first year, followed district's school calendar. **Qualifications/Training of staff:** Teachers applied for positions and were interviewed. Major selection criteria included an open mind and willingness to learn a completely different method of teaching. Teachers received training in the course platform, e-Education, and Florida Virtual School content. **Evaluation of virtual courses:** District plans to collect data from student questionnaires, personal interviews and an assessment of student performance.

Financial Information
Students were charged $250 per semester per course.

Issues Surfaced	Ideas/Suggestions Offered
❖ Cost of developing program and maintaining the program, along with overcoming skepticism. ❖ Cost for students to take the courses.	❖ District recommends that state provide some per student funding for those students not charged to subsidize district expense.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Vschool

Duncanville Independent School District 057-907-001
Duncanville, Texas

Duncanville ISD is an academically acceptable school district. The district has offered virtual courses since the summer of 2001 using purchased courses.

District/Charter Data	
Enrollment	10,808
Attendance Rate	95.5%
Dropout Rate	0.1%
Economically Disadvantaged	40.15%
Mobility Rate	NA
Limited English Proficiency	6.6%

District/Charter Demographics	
African American	44.0%
Asian/Pacific Islander	2.5%
Hispanic	24.0%
Native American	0.3%
White	28.0%

Program Description: Duncanville ISD offers Internet-based curriculum as an additional learning option for students using an external vendor product, Class.com. Courses are offered to students who have scheduling needs, as well as students who wish to accelerate their four year school plan.

Targeted Students: Students seeking early graduation or those wishing to take more courses than their schedule will allow.

Selection Process: Students completed a questionnaire, received program information and were required to meet with their counselor prior to enrollment to ensure adherence to the district's graduation requirement.

Benefits of Courses: The primary benefit is the ability to take extra classes, recover lost credits or to engage in a medium more suitable to their learning style. Students have increased interaction with the teacher and often find that they may learn more in this atmosphere, rather than in a traditional classroom of 25-30 students. Online learning is a perfect fit in the alternative/at risk campus environment. Students are often placed in this environment because of classroom problems that stem from a lack of self-discipline, yet they are sometimes expected to teach themselves. Virtual courses can offer more support and greater variety.

Security: District relied on locally-developed, end-of-course testing to ensure that the student had completed the course work. (These tests were previously submitted to TEA for review.)

Funding Method: Students pay fees for the courses. Duncanville ISD provides support including teacher stipends, materials and supplies, digital content development and teacher training.

Courses Offered: Government, Health, American History, Aquatic Science

*Program Information**	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	2	4	4
Grades Served	9-12	9-12	9-12
Students Enrolled	0	12	8
Students Completing Course	0	11	7

Note: Duncanville ISD offered two virtual courses for free in the summer 2001. Sixty students enrolled in the courses and 48 successfully completed the courses. When the district started charging fees for the courses in the fall 2001 there were no applicants. The district indicated that the students who enrolled in the spring 2002 were willing to pay because they needed the course for graduation.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

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Vschool

Duncanville Independent School District 057-907-001
Duncanville, Texas

Student Information	Program
Training Provided for Students to use virtual system. There was no special training provided to students on the hardware. The informational packet provided technology skill sets necessary for successful course completion with an online tutorial training. Vschool students have access to online and telephone support from 8 a.m. to 5 p.m. Monday through Friday. **Students complete coursework:** The coursework is completed by most students outside of the traditional school day. In most cases the work was completed at home on the students' personal computers. However, the high school library was open several nights a week and the students were able to access the courses there. **Time spent interacting with adults:** E-mail is the predominant method of interaction at 75%, 20% telephone and 5% face to face contact with the instructor. **Residency:** No residency requirement, however there are no students enrolled currently from outside of the district.	**Method used to determine compliance with TEKS:** Virtual teachers were asked to align the course documentation to the TEKS. **Method used to set instructional calendar:** Loosely follows district calendar, however there is not a tightly defined calendar. Students are expected to complete the course in a minimum of six weeks and a maximum of 18 weeks. **Qualifications/Training of staff:** Teachers were invited to be Virtual Pioneers and received training in online teaching techniques. Only teachers certified in the content area are allowed to teach the virtual courses. **Evaluation of virtual courses:** Evaluation will be based on three criteria: student response to a questionnaire on learner satisfaction; teacher response to a questionnaire on teacher satisfaction; and financial reports and costs analysis regarding the feasibility of continuing the program without state support.

Financial Information
Per student/per semester cost of each course offered is $190 for Duncanville students; and $250 for nonDuncanville students.

Issues Surfaced	Ideas/Suggestions Offered
❖ MONEY – costly for the districts as well as the students.	❖ Centralize the course development at the state level. Create a pool of trained virtual instructors that can deliver online instruction to students across the state. If the student is taking the course as part of their regular school day (meaning – within the number of courses a student could take in a traditional classroom), there would be no charge and the contact time would count toward ADA. If the student is taking the course above and beyond the regular schedule, they would pay a nominal fee.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Special Schools

Harris County Department of Education
Houston, Texas

Three school districts (Pasadena, Aldine and North Forest) offered electronic courses through the Harris County Department of Education Special Schools. Courses were developed internally using purchased curriculum and were targeted toward at-risk students. Online courses began April 2002.

District/Charter Data	
Enrollment	NA
Attendance Rate	NA
Dropout Rate	NA
Economically Disadvantaged	NA
Mobility Rate	NA
Limited English Proficiency	NA

District/Charter Demographics	
African American	NA
Asian/Pacific Islander	NA
Hispanic	NA
Native American	NA
White	NA

Program Description: The Department developed courses using Plato Learning and Learning Management Software. Some students are not able to attend classes due to health or disciplinary reasons; the Virtual School Program provides these students with alternative mechanisms for receiving quality instruction other than the traditional classroom. The program was expanded to include courses for credit recovery. The credit recovery program allowed students to repeat a course outside of the regular school hours. The courses were self-paced and monitored by a lead teacher. This provided the opportunity for students to recover needed credits for graduation without having to attend summer school or repeat the entire classroom course.

Targeted Students: High at-risk students. Alternative education and dropout prevention was the driving factor behind the decision to offer electronic courses. The Virtual School Program offered courses during the last six weeks of the school year to students who needed to recover credits or who were unable to attend classes during the regular instructional day.

Selection Process: Criteria for selection was based on the following issues: student has not received course credit due to grades, attendance or disciplinary reassignment.

Benefits of Courses:
Access to technology away from school. Course work could be completed on a flexible schedule. Provided alternative means of credit recovery other than summer school.

Security: Attendance was logged by the system.

Funding Model: Funding Model A: Contact Time.

Courses Offered: Independent Study in English; Reading Application and Study Skills; Reading I; and Algebra I and II.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	Not in Fall Pilot	2	2
Grades Served		9-12	9-12
Students Enrolled		15	23
Students Completing Course		10	21

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Special Schools

Harris County Department of Education
Houston, Texas

Student Information	Program
Training Provided for Students to use virtual system: Students were trained on as-needed basis. Majority of students were computer literate and able to access online courses with little instruction. A written instructional manual was provided to all students. **Students complete coursework:** Majority (70%) of students completed work during the regular school day for credit recovery. Homebound students comprised 10% of the participants and 20% of students completed courses after school for IP placement. **Time spent interacting with adults:** Students spent at least one to three hours a week interacting with teachers. Students had limited or no access to technology at home so parent interaction is low. **Residency:** All students must be enrolled in one of the three school districts and the Harris County Department of Education Special Schools.	**Method used to determine compliance with TEKS:** A comparison was made between the computer-based learning objectives and TEKS, using an item-by-item analysis. **Method used to set instructional calendar:** Districts set instructional calendar. **Qualifications/Training of staff:** Texas teacher certification required. School principals selected teachers. Staff received two days of training, which included online course management and lesson resource development. **Evaluation of virtual courses:** The IQ (Investigating Quality) Pilot guidelines were used to establish the quality of online courses. These guidelines were used in selection of the online courses. The program was evaluated for both content and student completion rate. Lead teachers monitored student progress and adjusted the courseware as needed to ensure alignment to the TEKS and student mastery. Students were given a pre- and post-test and results were analyzed for achievement gains. 98% of the students taking online courses mastered 100% of material.

Financial Information
Per student/per year (or one credit) cost of each course offered was $100. Approximate cost of developing one electronic course was $3,500. Harris County costs were recovered through fees to client districts.

Issues Surfaced	Ideas/Suggestions Offered
❖ Students had difficulty gaining access to technology outside of school.	❖ It would be beneficial for shared arrangement cooperatives to have separate PEIMS numbers, eliminating separate reporting by each district.

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Virtual School-Advanced Placement

Houston Independent School District 101-912-405
Houston, Texas

Houston ISD is an academically acceptable school district. The district has two virtual school programs in the pilot, a middle school program and an advanced placement (AP) program serving high school students. This profile contains information for the high school AP program.

District/Charter Data	
Enrollment	210,993
Attendance Rate	94.5%
Dropout Rate	3.2%
Economically Disadvantaged	78.9%
Mobility Rate	NA
Limited English Proficiency	27.2%

District/Charter Demographics	
African American	31.0%
Asian/Pacific Islander	3.0%
Hispanic	56.0%
Native American	0.1%
White	9.6%

Program Description: Houston ISD offers AP courses to its secondary students using an external vendor product, Apex Learning systems. The AP students use the *Online Courses* curriculum and take the courses during their free time at school, at night or at home.

Targeted Students: Above average students are targeted in each discipline.

Selection Process: Counselors evaluate if student has met prerequisites and is eligible for an AP course. Course fee is waived if there is a schedule conflict or course is not available at student's school; otherwise, student pays fee.

Benefits of Courses: Motivated students can progress at their own pace. Students are able to take courses that are otherwise not available to them because of scheduling or other reasons.

Security: Maintained through assigned user name and password for course access.

Funding Method: Development was funded from departmental budget, grants and the tuition from the online courses. Grant funds came from the Telecommunications Infrastructure Fund (TIF) and the Technology Integration in Education (TIE) programs. Houston ISD selected Funding Model A: Contact Time to fund student enrollment in the VSP.

Courses Offered: English Literature and Composition, Calculus, Statistics, US History, Microeconomics, Macroeconomics, US Government, Chemistry, Physics.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	17	17	17
Grades Served	9-12	9-12	9-12
Students Enrolled	175	185	25*
Students Completing Course	175	185	25

**Note: Students enrolling during the summer were required to pay the $475 course fee. This impacted the number of students able to enroll.*

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Virtual School-Advanced Placement

Houston Independent School District 101-912-405
Houston, Texas

Student Information	Program
Training Provided for Students to use virtual system. Students participate in a half-day orientation session conducted by Virtual School Department staff. Orientation provides basic knowledge in how to navigate through the course. Vendor online student support services center provides additional assistance as well as the Virtual School technical support staff. **Students complete coursework:** Classroom students complete coursework in classroom during the day. Out of classroom, students complete work at home in the evening. **Time spent interacting with adults:** E-mail is the predominant method of interaction (97%) with minimal telephone, mail and face-to-face contact (1% for each). **Residency:** The program is free to HISD high school students. Students who do not attend an HISD high school must pay a course fee of $475.	**Method used to determine compliance with TEKS:** The AP courses meet the standards and have been accredited by the Northwest Association of Schools and Colleges. Each year the vendor demonstrates compliance with the Association's standards for distance-education schools. **Method used to set instructional calendar:** Calendars were shared between the vendor and district. Mutual start and stop dates were set. **Qualifications of staff to develop in house programs:** Not Applicable **Evaluation of virtual courses:** Vendor is currently developing a required self-study to evaluate the courses.

Financial Information
Per student/per semester cost of each course offered is $475.Cost is based on vendor's set price (flat fee) based on a per student access.

Issues Surfaced	Ideas/Suggestions Offered
	❖ Use of student login can be tied to student attendance and accountability measures – providing a time stamp of student participation (PEIMS reporting). ❖ Collect a dollar amount per student (computer use fee) in support of "virtual learning" program and pool for courseware development. ❖ Allow school district to allocate funds for participation in electronic courses.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Virtual School-Middle School

Houston Independent School district 101-912-405
Houston, Texas

Houston ISD is an academically acceptable school district. The district has two virtual school programs in the pilot, a middle school program and an advanced placement (AP) program serving high school students. This profile contains information for the middle school program.

District/Charter Data	
Enrollment	210,993
Attendance Rate	94.5%
Dropout Rate	3.2%
Economically Disadvantaged	78.9%
Mobility Rate	NA
Limited English Proficiency	27.2%

District/Charter Demographics	
African American	31.0%
Asian/Pacific Islander	3.0%
Hispanic	56.0%
Native American	0.1%
White	9.6%

Program Description: Houston ISD has developed 12 middle school courses locally that cover all core subjects. The program is aimed at nontraditional as well as traditional students in a regular class. In 2001-02 most students were regular full-time middle school students in HISD. Teachers used the online courses as an enrichment of the regular program.

Targeted Students: Average students in Grades 6, 7, and 8.

Selection Process: HISD students register through their regular school campus with the assistance of school counselors. NonHISD students register through the Virtual School office. The program is open to all students.

Benefits of Courses: Courses help students master subject content, as well as develop communication, collaboration and creative problem-solving skills. Increases technology skills.

Security: Students are assigned passwords to access the system. Time on the system is logged by the system. If the course is used for credit, tests are proctored.

Funding Method: Development was funded from departmental budget, grants and the tuition from the online courses. Grant funds came from the Telecommunications Infrastructure Fund (TIF) and the Technology Integration in Education (TIE) programs. Houston ISD selected Funding Model A: Contact Hours to fund student enrollment in the state virtual school pilot.

Courses Offered: English, Math, Science and Social Studies (Grades 6, 7 and 8)

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	4	4	12
Grades Served	6-8	6-8	6-8
Students Enrolled	400	440	60
Students Completing Course	400	440	60

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Virtual School-Middle School

Houston Independent School district 101-912-405
Houston, Texas

Student Information	Program
Training Provided for Students to use virtual system. Through the weeklong courseware orientation, students practice using a computer and a printer. However, a basic understanding of the operation of a computer is assumed. **Students complete coursework:** Currently, 98% of the students taking the Virtual School courses are taking them in a regular classroom and have direct contact with an on-site teacher and their classmates. **Time spent interacting with adults:** Most students take the course in a regular classroom with an on-site teacher. **Residency:** The program is free to HISD middle school students. Out-of- district students pay a fee of $250 per course per semester.	**Method used to determine compliance with TEKS:** Courses are aligned with HISD planning tool used by all HISD instructional staff. **Method used to set instructional calendar:** Same calendar as HISD. **Qualifications/Training of staff:** Program uses eight developers who are certified Texas Teachers with master degrees and proficient in Macromedia Web Studio Suite. The program also uses a graphic designer who has three years industry experience and is proficient in Macromedia and Adobe products. **Evaluation of virtual courses:** The online teacher/ developer will track end-of-semester and end-of-year grades for each grade level and discipline.This data will be compared to past classes and students not participating in the virtual school. An independent evaluation team of teachers, college professors and business people is currently analyzing the data.

Financial Information
Cost of course is free to HISD students. Out-of-district students are charged $250 per course per semester.

Issues Surfaced	Ideas/Suggestions Offered
	❖ Fund development separately using grants or other funding methods.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Katharine Anne Porter Virtual High School

Katharine Anne Porter High School 105-801-001
Wimberly, Texas

The Katharine Anne Porter High School (KAP) is a charter school located in the Hill Country of central Texas. The Virtual High School program began in spring 2002 and was focused on providing additional course opportunities for students of the charter school, especially seniors.

District/Charter Data	
Enrollment	204
Attendance Rate	88.9%
Dropout Rate	2.0%
Economically Disadvantaged	22.55%
Mobility Rate	NA
Limited English Proficiency	0.0%

District/Charter Demographics	
African American	0.0%
Asian/Pacific Islander	0.5%
Hispanic	10.0%
Native American	0.0%
White	89.0%

Program Description: Courses were developed internally by charter school teachers upon demand by students, especially seniors. The initial courses were limited to online detailed course outlines.

Targeted Students: Regular full-time students of the charter school.

Selection Process: The student must apply and obtain references from two previous teachers vouching for student's readiness; the student must agree to maintain a passing grade of 70%; have access to a computer and the Internet, and have an e-mail address. Application includes a self- assessment questionnaire.

Benefits of Courses: Individualized educational plans.

Security:

Funding Method: Development was funded from grant monies, local funding, foundation monies and fundraisers.

Courses Offered: English III and IV; Speech; Spanish II; Government and Economics; Health; Physics; and World Geography.

The following courses were offered by Austin Community College for dual credit: Personal Computing; Introduction to Physical Geography; and U.S. History.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	None Offered	12	8
Grades Served		9-12	9-12
Students Enrolled		9	10
Students Completing Course		8	

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Katharine Anne Porter Virtual High School

Katharine Anne Porter High School 105-801-001
Wimberly, Texas

Student Information	Program
Training Provided for Students to use virtual system: All students were required to attend a workshop on campus for instruction on hardware and software used for the virtual school. **Students complete coursework:** Work associated with the course was completed in the afternoons or evenings. **Time spent interacting with adults:** 2 1/2 hours per week, 100% via email. **Residency:** Limited to KAP charter students.	**Method used to determine compliance with TEKS:** Staff developed and wrote the courses in alignment with the TEKS. **Method used to set instructional calendar:** The regular instructional calendar for the school was used. **Qualifications/Training of staff:** KAP teachers volunteered to design online content. The most important qualifications for teachers were dedication and knowledge of subject matter. **Evaluation of virtual courses:**

Financial Information

Issues Surfaced	Ideas/Suggestions Offered

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Magnolia High School

Magnolia Independent School District 170-906-001
Magnolia, Texas

Magnolia ISD is an academically acceptable school district located near Houston. The district began its virtual program in fall 2001 using purchased courses provided through the Texas Virtual School, a Web-based learning initiative sponsored by Texas regional education service centers.

District/Charter Data	
Enrollment	7,745
Attendance Rate	96.0%
Dropout Rate	0.6%
Economically Disadvantaged	27.87%
Mobility Rate	NA
Limited English Proficiency	5.5%

District/Charter Demographics	
African American	2.7%
Asian/Pacific Islander	14%
Hispanic	0.3%
Native American	0.4%
White	83.0%

Program Description: Program used purchased courses from Class.com. and APEX. Magnolia ISD's virtual program was aimed at regular full-time students who wanted additional credits, credit recovery and flexibility in schedules.

Targeted Students: Students who are generally self-motivated, mature in their demeanor, good readers and writers, well organized, comfortable with technology and willing to try something different.

Selection Process: Students were recommended by counselors and grade-level principals based on students' academic histories and performance tendencies. Students were interviewed by the virtual school coordinator and then parents were contacted. After all parties were in agreement with and acceptance of the policies, students were enrolled in the virtual school program.

Benefits of Courses: The main benefit was flexibility. These courses offered students flexibility with scheduling, offerings and time restrictions that are not necessarily available within traditional school structure.

Security: The Web course platform supplied a built-in tracking system that recorded student contact time. Verification was established through proctored exams with the assumption that students would have to complete the course work to pass the exam.

Funding Method: Funding was derived from the technology budget, but the district plans to use ADA to recover the course enrollment costs.

Courses Offered: U.S. Government; U.S. History; and English III.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	3	3	3
Grades Served	9 – 12	9 – 12	9 - 12
Students Enrolled	2	7	6
Students Completing Course	0	2	10 Includes students from Fall and Spring

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Magnolia High School

Magnolia Independent School District 170-906-001
Magnolia, Texas

Student Information	Program
Training Provided for Students to use virtual system: No hardware training was offered initially; tutorials were offered if student experienced problems with hardware. There were built-in tutorials on each course's software. **Students complete coursework:** Most students worked on their courses at night and on weekends. **Time spent interacting with adults:** Student interaction varied. Student-to-teacher comprised 70% of interactions, usually through e-mail, discussion boards and/or chat rooms. Student to mentor/tutor comprised 20% of interactions, most through e-mail. Student-to-parent interactions were the remaining 10%, almost always face-to-face. **Residency:** All virtual school students were registered with the district and had a designated home campus. There are no plans to include nondistrict students in the program.	**Method used to determine compliance with TEKS:** All courses were carefully scrutinized against the TEKS. If any TEKS item was not addressed by the courseware, it was identified and the instructor was responsible for amending the course requirements so that all TEKS issues were addressed. **Method used to set instructional calendar:** Coincidental with district calendar for traditional school, however not bound by concrete dates. **Qualifications/Training of staff:** Virtual courses instructors were all recommended by the course provider. All were certified Texas teachers and completed a 36 hour training program. **Evaluation of virtual courses:** Students and parents were contacted and questioned about their level of satisfaction (academic/user friendliness). Follow-up sessions with instructors insured that any rough spots with navigation or procedure were smoothed over for subsequent students/classes. Additionally, there was spot testing of the navigability of the courseware and the quality of the materials in the course.

Financial Information
Per student/per semester cost of each course offered is $295.

Issues Surfaced	Ideas/Suggestions Offered
❖ Most common problem was meeting face-to-face with students on a regular basis.	❖ Develop unique PEIMS identification numbers for virtual courses. ❖ Include virtual courses as itemized options in TIF Grant applications.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

eSchool

Plano Independent School District 043-910-006
Plano, Texas

Plano ISD is a recognized school district located in the Dallas metroplex area. The eSchool was aimed at regular full-time students who wanted additional courses.

District/Charter Data	
Enrollment	49,901
Attendance Rate	96.4%
Dropout Rate	0.3%
Economically Disadvantaged	10.37%
Mobility Rate	NA
Limited English Proficiency	7.5%

District/Charter Demographics	
African American	7.7%
Asian/Pacific Islander	0.4%
Hispanic	11%
Native American	0.3%
White	67.0%

Program Description: Plano ISD eSchool offered students high school courses through independent Internet study. It is a true online educational alternative in that students completed all facets of a course online, communicating with the teacher through e-mail. Each student worked with his/her teacher, who monitored the consistency and maturity level of completed course assignments and correspondence.

Targeted Students: Students in Grades 8-12 who had the desire to enhance high school experience with additional courses, students experiencing scheduling difficulty and those who are credit deficient.

Selection Process: Students were asked to complete a self-assessment before registering to help them decide whether an eSchool course was right for them. In addition, students were asked to work with their home campus counselor to ensure that course credit would be accepted by that campus and count toward their graduation plan.

Benefits of Courses: For the district and individual campuses, eSchool provided an additional educational alternative to help meet the needs of all students. Schools could offer courses without having a minimum number of students enrolled, even where there was not a certified teacher on campus, to students who were homebound and to students who were home-schooled.

Benefits for students included the ability to progress at their own pace, earning credit for graduation outside the normal classroom setting, more flexibility to take enrichment courses on campus since they could take required courses off campus, and the ability to earn credits needed for graduation.

Security: All private student information given in the registration process was stored on a secured server at Plano ISD. For financial privacy, credit card information went directly to the represented bank at its secured location and Plano ISD did not receive this information. For course security and privacy, each student was assigned a secure login and password.

Funding Method: Local funds through the PISD eSchool budget. Since Plano ISD eSchool is a true online educational experience, it does not benefit from current funding models available from the State.

Courses Offered: Geometry; PreCalculus; Chemistry; Health; Physics; Psychology; U.S. Government; Career Studies; International Business; Introduction to Business; English III/IV; Economics; Spanish; Algebra; General Math; Study Skills; Composition; Oceanography; and World History.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	28	30	
Grades Served	9-12	9-12	
Students Enrolled	NA	407	
Students Completing Course	NA	157*	

**Note: Program used continuous enrollment. Students had six to 18 weeks to complete the course based upon the individual course. There were no semesters in the traditional sense. Information above runs from August 2001 to August 12, 2002. Some students will be completing course work in fall 2002. Out of 407 enrolled, only 33 have cancelled, dropped or been dropped.*

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

eSchool

Plano Independent School District 043-910-006
Plano, Texas

Student Information	Program
Training Provided for Students to use virtual system: Students must possess basic computer skills. **Students complete coursework:** Students completed the work on their own time off campus wherever access is available to the Internet and a computer. **Time spent interacting with adults:** Students interacted with teachers by e-mail as they worked through the course. **Residency:** There were no residency requirements. It was the responsibility of students to make certain that a course was approved for credit by their local campus.	**Method used to determine compliance with TEKS:** Courses purchased from Class.com were reviewed by the Plano ISD Curriculum Department to ensure that the content aligned with TEKS. Plano ISD courses were created to be aligned with the Plano ISD instructional objectives, which are aligned with the TEKS. **Method used to set instructional calendar:** Students had six to 18 weeks to complete an eSchool course. When a student registers, the teacher sends the student a suggested calendar for course completion based on 18 weeks. The student can accelerate to complete the course in less than 18 weeks. **Qualifications/Training of staff:** Plano ISD eSchool courses were developed by experienced classroom teachers certified in each discipline, working with the technology department. **Evaluation of virtual courses:** The Plano ISD Health and World History courses have been submitted to the TEA Investigating Quality of Internet Courses (IQ) Project for evaluation. The evaluation for the Health course is not complete as yet. The World History course received the rating of "Meets Criteria".

Financial Information
❖ The tuition for courses developed by PISD eSchool was $220 per semester credit per student (.5 credit). The student was responsible for the tuition. ❖ The tuition for Class.com courses was $295 per semester credit per student (.5 credit). The student was responsible for the tuition. ❖ Funding for development of all Plano ISD eSchool electronic courses was from local funds through the PISD eSchool budget. ❖ Approximate cost of developing one electronic course was $50,000. ❖ Approximate training costs for teachers and staff associated with e-courses per person was $300 - $600 annually.

Issues Surfaced	Ideas/Suggestions Offered
❖ Costs for developing e-courses can be prohibitive for a district. ❖ Most significant challenge for the district was identifying the funding source.	❖ A system of WADA must be developed to support districts as they provide online instruction for students. Without such a system, individual districts will not be able to continue to bear the burden of course development and delivery.

112

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Southwest Preparatory Virtual School

Southwest Preparatory Charter 015-807-003
San Antonio, Texas

Southwest Preparatory Charter School is a charter school located on three campuses in San Antonio, Texas that actively focuses on at-risk students. The charter's virtual program began in December 2001. The program uses an online version of the purchased courseware used in regular charter school classes.

District/Charter Data	
Enrollment	260
Attendance Rate	94.5%
Dropout Rate	6.0%
Economically Disadvantaged	33.08%
Mobility Rate	NA
Limited English Proficiency	0.0%

District/Charter Demographics	
African American	34.0%
Asian/Pacific Islander	2.3%
Hispanic	36.0%
Native American	0.4%
White	28.0%

Program Description: Southwest Preparatory used PlatoWeb Learning courses to bring a high school education to certain student groups (those with medical or pregnancy issues, work concerns or behavioral challenges) who are at-risk.

Targeted Students: Program was aimed at nontraditional students. It was particularly beneficial to students with medical or pregnancy issues.

Selection Process: Students were interviewed to ensure that they understood the requirements, strengths and weaknesses of the program.

Benefits of Courses: Schedule flexibility. The program provided an alternative education opportunity to students who would otherwise drop out of school.

Security: Login times were tracked by the PlatoWeb Learning System. Students took a proctored exam at the school validating their learning before receiving credit. The program did not consider biometrics.

Funding Method: The program chose VSP Funding Model A: ContactTime.

Courses Offered: Core courses in Grades 9-12.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	18	4	12
Grades Served	9-12	9-12	9-12
Students Enrolled	6	56	21
Students Completing Course	0*	9	9
** Note: Virtual classes began in December 2001.*			

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Southwest Preparatory Virtual School

Southwest Preparatory Charter 015-807-003
San Antonio, Texas

Student Information	Program
Training Provided for Students to use virtual system: There was a 30 minute orientation program on access and e-mail. Software program was largely intuitive, so training was limited to 10 minutes in most cases. **Students complete coursework:** Students typically complete work at home on their own computers but computers are also available on campus. While evenings are somewhat more popular, there is no time during the week that students did not access the system. **Time spent interacting with adults:** Students spent approximately one to two hours a week on average interacting with school personnel. E-mail was the predominant method of interaction (80-90%). Students came in for an hour or two of tutoring on an irregular basis. **Residency:** Residency requirements mirror those of the charter school. Specifically, students must reside in Bexar County.	**Method used to determine compliance with TEKS:** Plato course documentation was compared to TEKS to verify that the courses were aligned to state standards. Plato provided support and documentation in this area. Southwest Prep supplemented the course with additional activities and materials. **Method used to set instructional calendar:** The calendar mirrored that of the regular campuses. Courses were self-paced, which allowed for significant variance in time to master the material. **Qualifications/Training of staff:** Charter school sought an administrator with experience administering special programs, a strong background in educational technology, and the ability to tutor students in all four core subjects. Teachers and staff from the three physical campuses were also available to help regarding subject content, attendance and counseling issues. Administrator learned the PlatoWeb Learning System. **Evaluation of virtual courses:** The Virtual School administration will collect and analyze data on attendance, course completion and TAAS results in addition to subjective data from surveying students.

Financial Information
Program was offered free to students.

Issues Surfaced	Ideas/Suggestions Offered
❖ Providing dial-up access to our school network would allow an expansion of offerings to the students, but to date this has been cost prohibitive. ❖ If we want to be able to offer a full secondary curriculum online, a significant difficulty will be to add elective courses. Plato offerings are currently focused on core subject areas. Additional manpower would be needed and this is not financially feasible with existing funds.	❖ Most e-mails to students were copied to parents. This has been tremendously popular as it gives parents a better understanding of student progress than they were able to get in a traditional school. Students whose parents/guardians received copies of e-mail correspondence were more successful in terms of attendance and course completion. ❖ Two four-hour slots were made available for students without the necessary equipment. Junior Achievement of San Antonio also donated equipment that we have set up in the home of a student with transportation difficulties.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

SUPERNet Consortium

Tyler, Texas

This program is sponsored by SUPERNet, a consortium of 17 school districts in east Texas. The consortium also provides technology services to these mostly small rural districts. The virtual program began in the summer 2002 using a course developed by the Florida Virtual School.

District/Charter Data	
Enrollment	NA
Attendance Rate	NA
Dropout Rate	NA
Economically Disadvantaged	NA
Mobility Rate	NA
Limited English Proficiency	NA

District/Charter Demographics	
African American	NA
Asian/Pacific Islander	NA
Hispanic	NA
Native American	NA
White	NA

Program Description: Using a course developed by the Florida Virtual School, the program began in summer 2002. The consortium plans to develop its own courses beginning in the 2002-03 school year. As part of that plan, the consortium has been chosen by Microsoft to be one of its ten regional centers across the nation to implement Microsoft Class Server, a course building tool.

Targeted Students: This program is open to regular full-time students of the 17 districts that need/want additional credits. However, the program is geared more toward gifted and talented students. Students in the first course came from 10 districts in the consortium.

Selection Process: Students must have completed Algebra I and apply for enrollment.

Benefits of Courses: The virtual courses offered students flexibility with scheduling and self- pacing. Students learned to work independently and learned to think. This course used an application type of format rather than simple memorization. This was quite challenging for many students and proved frustrating for many at first. However, students improved as the course went on.

Security: Students used a username and a password. The program maintained a log of time spent by the students online. Students took a mid-term and final exam at the student's home campus with a proctor.

Funding Method: Currently, funding is through the SUPERNet fund balance. VSP Funding Model B2: Successful Course Completion was selected but no TEA funds were requested as this was a summer school course.

Courses Offered: Geometry

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	None offered	None offered	1
Grades Served			8-12
Students Enrolled			37
Students Completing Course			30

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Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

SUPERNet Consortium

Tyler, Texas

Student Information	Program
Training Provided for Students to use virtual system: No training was offered on hardware, except on an individual basis. One initial face-to-face meeting introduced students to the software; any additional training happened individually. **Students complete coursework:** Students completed the work during the summer during the day or evening. **Time spent interacting with adults:** Telephone 40%, Instant Messaging 40%, e-mail 18%, face-to-face 1%, and online integrated course chat 1%. **Residency:** The course was open to SUPERNet students only due to the size limitations placed on this course.	**Method used to determine compliance with TEKS:** The course was leased through Florida Virtual School. The course, previously used by Birdville ISD, had already been aligned to the Texas TEKS. **Method used to set instructional calendar:** The Florida Virtual School issued pacing charts to students, one for a year-long course and one for a semester-long course. The offered course was a summer school course so the calendar for the semester course was amended to reflect the difference in length. **Qualifications/Training of staff:** The teacher was a certified Texas math teacher, willing to teach the course during the summer term. **Evaluation of virtual courses:** *VSP Board Recommendations* - In addition to advanced courses, also provide Algebra I and English I for students to take in conjunction with the same courses taken at school for students who are struggling at the ninth grade level. *Student Evaluation information* - Students using MSN Messenger or phone to contact teacher regularly were more successful; students tendency to procrastinate increased as deadlines approached; students' favorite aspect of the course was their ability to pretest and test out of sections already mastered; students averaged 96 sessions online at an average of 1 hour 30 minutes per session; 8th grade students who had not ever been on a high school campus were the least successful students. *Parent surveys* - 49% returned, all but one requested additional courses; some felt summer was too short to complete an entire year with other summer activities- would liked to have allowed continuation into the first semester; reported their child enjoyed self-pacing, felt they had a similar grasp of material to that acquired in a classroom setting; enjoyed parent access to coursework; felt students learned additional skills such as independence, analytical thinking, asking for help, and time management.

Financial Information
Per student cost: $96 Florida Virtual School course content; $15 Jones Knowledge course hosting.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

SUPERNet Consortium

Tyler, Texas

Issues Surfaced	Ideas/Suggestions Offered
❖ An online orientation to assist students with setting up the technical aspects and to allow a trial run to determine if an online environment is right for them prior to starting the course would be helpful. This should require about one week of work prior to enrolling in the course. This could be waived or modified to include only new aspects when students have already successfully completed an online course. ❖ It is important for teachers to "own" the course. They then have a better grasp of scope and sequence and better insight into where and why students are stumbling. SUPERNet will thus develop their own courses in the future. ❖ SUPERNet's infrastructure is sufficient to handle a Virtual School, thereby eliminating the hosting and leasing fees. This cuts ongoing costs to staff. This kind of collaborative that includes shared staff among rural schools, enables the partners to provide additional curriculum opportunities and shift staffing as needed to partially offset costs. ❖ Excellent teachers can be excellent online teachers with the proper tools. ❖ Courses need to be more interactive, more media intensive, and have a teacher constantly available to students. Students using instant feedback models such as MSN messenger were most successful.	❖ State should fund a virtual school that supports this program statewide. Funding should be separate from ADA funding as this discourages participation. ❖ Program should be open to home schooled students but supervised by a counselor in their district of residence.

University Charter School Online Campus

University of Texas at Austin Continuing and Extended Education 227-806-018
Austin, Texas

The University Charter School is a charter school located in Austin, Texas, offered through the University of Texas Continuing and Extended Education Division. The virtual program is a separate campus of the charter school. Courses are offered to students of high school age throughout the state of Texas.

District/Charter Data	
Enrollment	229
Attendance Rate	98.3%
Dropout Rate	0.8%
Economically Disadvantaged	51.53%
Mobility Rate	NA
Limited English Proficiency	0.0%

District/Charter Demographics	
African American	25.0%
Asian/Pacific Islander	0.9%
Hispanic	15.0%
Native American	0.0%
White	59.0%

Program Description: The virtual program redesigned existing paper-based content courses to an online platform developed internally. Using CD-ROMs, courses were enhanced with interactive activities and opportunities for students to interact with the content, the instructor and the Distance Education Center (DEC) office. Students studied independently. Since courses were asynchronous, chat rooms were not provided. Interaction between students and instructors occurred through a delivery mechanism much like e-mail. Students interacted with the Internet according to specific directions given in lessons. This program is aimed at students who do not participate in traditional learning environments.

Targeted Students: Students who were seeking flexibility in an academic program.

Selection Process: The only requirements for admission were the Texas public school guidelines for age and residency. A student questionnaire was completed by new students; however, the information given by the students was not used to determine admission into the program.

Benefits of Courses: The program offered flexible options for students who chose not to or who are unable to participate in traditional learning environments.

Security: To access the courses, students were issued UT Electronic Identifications (EIDs). The UT EID system is a well-established, highly sophisticated electronic identification system used by UT Austin to secure records for faculty, staff and students. Students were required to submit a weekly Academic Time Log. To receive credit for a course, student had to pass a proctored exam. (Exams were previously approved by TEA.)

Funding Method: Development funded through tuition and fees. The charter selected VSP Funding Model A: Contact Time.

Courses Offered: Algebra I/II; Geometry; Pre-Calculus; Math Models; Biology; IPC; Economics; Government; World History; World Geography; U.S. History; English I/II/III/IV; Communication Applications; BCIS; Health; Individual & Family Life; Marketing; Retailing; Spanish I/II/III; and Food Marketing.

Program Information	*Fall 2001*	*Spring 2002*	*Summer 2002*
Courses Offered	44	44	0
Grades Served	9-12	9-12	9-12
Students Enrolled	148	45	0
Students Completing Course	24	5	0
Students Continuing to Work on Courses	0	10	0

BEST COPY AVAILABLE
Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

University Charter School Online Campus

University of Texas at Austin Continuing and Extended Education 227-806-018
Austin, Texas

Student Information	Program
Training Provided for Students to use virtual system: Hardware training was not provided to the students. Basic computer skills were a prerequisite. **Students complete coursework:** Students provided their own computers and Internet connections. They could access computers and Internet connections at home, libraries or offices. **Time spent interacting with adults:** Interaction between students and instructors occurred through a delivery mechanism much like e-mail. **Residency:** The only requirement for charter school students was that they be Texas residents of high school age.	**Method used to determine compliance with TEKS:** All lessons and items on corresponding exams were designed in collaboration with certified Texas teachers and were aligned to the TEKS. **Method used to set instructional calendar:** The calendar was designed to allow the maximum of 180 instructional days and to conclude by July 31, 2002. Within the year, attention was given to modification where appropriate to accommodate individual student needs. **Qualifications/Training of staff:** All course instructors were certified Texas teachers who participated in ongoing training for the virtual school environment. There were four teams who had contact with students: administrators, who were required to have experience and current training in TEA guidelines including PEIMS; DEC Student Services, who answer general questions; DEC Help Desk, who answer technology questions; and teachers, who work with the students. **Evaluation of virtual courses:** Students will be surveyed to collect data relating to the enrollment process, attendance requirements, course curriculum, instructor availability and feedback, testing procedures and overall satisfaction with the program.

Financial Information
Program was free to students. The cost to redesign an existing course for online use is approximately $15,000 per course.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

University Charter School Online Campus

University of Texas at Austin Continuing and Extended Education 227-806-018
Austin, Texas

Issues Surfaced	Ideas/Suggestions Offered
❖ It was difficult to verify that a student was participating in the course work on a daily basis. ❖ In the pilot, students were required to take five courses per semester. In talking with students and teachers, the course load emerged as a major problem for online students. ❖ Some students are clearly not good candidates for independent online learning, which requires self-discipline, time management skills and on-grade-level reading ability.	❖ Allow funding to be based upon successful completion of lessons with additional funding available for successful completion of a final examination. ❖ In traditional programs, districts continue to receive ADA funding as long as a student attends school. Based on this precedent, we are hopeful that funding will be authorized for students who successfully complete some of their lessons but do not complete an entire course. ❖ Often, students in traditional classrooms repeat courses because they fail or do not complete the course in their first attempt. ADA is paid each time a student sits in a classroom. We are hopeful that online funding strategies will take this into account. ❖ Allow students to take fewer online courses to be considered full-time. ❖ Devise a pretest to help determine whether a student will be a good candidate for online independent learning and then limit enrollments to those students who show they will likely succeed.

Source: PEIMS 2001-02, AEIS 2000-01, pilot surveys and site visits.

Appendix B

VSP Data Collection Instruments

Appendix B: VSP Data Collection Instruments

Program Description

District/Charter School Name _____

District/Charter School Number_____-_____-_____

Please complete this form for the electronic courses offered through the TEA pilot program. If the responses are the same for all the pilot program courses, you may use one form (be sure to indicate all the PEIMS ID numbers, however). If there is variation from course to course, please copy this form and use a separate form for each course approved for the pilot program. If you need additional space to answer a question, you may write on the back of the form or attach a separate page.

If you have questions about the instrument, please contact Barbara Speer at (512) 418-8379 or barbaraspeer@sdsm.com.

Course Name and PEIMS ID number _____

1. How did you determine if an electronic course met the requirements of the Texas Essential Knowledge and Skills? What procedures were used to ensure that the program addressed all TEKS? For purchased or leased products, please provide the company's documentation that the course reflects the TEKS.

2. Please submit a copy of the course instructional plan.

3. Please submit a copy of the actual program (not just the program description) for review. If special arrangements are required (such as copyright assurance), please contact a member of the evaluation team.

4. What is your definition of the term "virtual classroom?"

5. If the program was developed "in-house," please describe the qualifications of the staff members involved in the development.

6. For courses that require lab work or other physical demonstrations, how are these requirements met?

7. For K-2 courses, are students taking the courses individually, in groups or in another arrangement?

8. Please note any other comments regarding the program.

Staffing Information

District/Charter School Name_____

District/Charter School Number_____-_____-_____

Please complete this form for the electronic courses offered through the TEA pilot program. If the responses are the same for all the pilot program courses, you may use one form (be sure to indicate all the PEIMS ID numbers, however). If there is variation from course to course, please copy this form and use a separate form for each course approved for the pilot program. If you need additional space to answer a question, you may write on the back of the form or attach a separate page.

If you have questions about the instrument, please contact Barbara Speer at (512) 418-8379 or barbaraspeer@sdsm.com.

One contributing factor to the success of students taking an electronic course is the availability of appropriate support. One important support is the availability of trained teachers, mentors, and tutors to help students understand and master the materials.

Course Name and PEIMS ID number _____

1. How were teachers selected to be a part of the virtual classroom? How was the teacher of record established? What qualifications were most important when making these decisions?

2. Describe how special education certification requirements were met for any eligible students participating in the program.

3. How were other staff or volunteers who might have contact with students (mentors, tutors) selected to be a part of the virtual classroom? What qualifications were most important when making these decisions?

4. What specific training did staff receive in order to work with the virtual classroom (e.g. training on conducting online discussions, hardware or software)?

5. Did the parents of K-2 students receive training in the use of either hardware or software? If yes, describe this training including the approach and time commitment from parents and staff.

6. Please note any other comments regarding the staffing.

General Student Data

District/Charter School Name _____

District/Charter School Number _____-_____-_____

Please complete this form for the electronic courses offered through the TEA pilot program. If the responses are the same for all the pilot program courses, you may use one form (be sure to indicate all the PEIMS ID numbers, however). If there is variation from course to course, please copy this form and use a separate form for each course approved for the pilot program. If you need additional space to answer a question, you may write on the back of the form or attach a separate page.

If you have questions about the instrument, please contact Barbara Speer at (512) 418-8379 or barbaraspeer@sdsm.com.

1. Course Name and PEIMS ID number _____
2. What criteria, if any, were used to determine which students could take an electronic course? Please provide a description of the criteria and any materials (such as questionnaires or interview protocols) that were used in this process.
3. Describe any accommodations made for students with disabilities to enable them to access the program.
4. What are the characteristics (such as independent learners, socially isolated, or technologically sophisticated) of students most likely to take this type of course? Are they unique in some quantifiable or qualitative way?
5. What types of students (relate to question 4) are most likely to benefit from this type of course?
6. What types of students (relate to question 4) are most likely to fail and succeed in this type of course?
7. What is the primary benefit for students taking an electronic course?
8. Do the courses you offer target specific students (e.g., talented/gifted, at-risk)?
9. What interactions do students taking an electronic course have with other students? This might range from no interaction to taking most of the course in a regular classroom. Include opportunities for involvement in activities such as lunch periods, P.E., or extracurricular activities.
10. Describe the training received by students to operate hardware used in the virtual classroom (such as the basic operation of a computer, printer or scanner). How long did the training last?
11. Describe the training received by students to operate software used in the virtual classroom (such as training in a particular computer program). How long did the training last?
12. When do students complete most of the "work" associated with taking the course (e.g., nights, weekends or during the regular school day)? Answer from a sample if appropriate.
13. Approximately how much time do students spend interacting with adults, including teachers, tutors, mentors or parents? Please characterize the interactions (e.g., face-to-face or e-mail) and estimate what percentage (or actual amount) of time was spent in each. Answer from a sample if appropriate.
14. What residency requirements (if any) apply to students taking these courses? If students were served from outside the district or geographic service area, what arrangements were made with the home district?
15. Please note any other comments regarding general student data.

Individual Student Data

This information is requested for every student in every course. A separate Excel spreadsheet should be submitted for each course. Please use the spreadsheet provided by TEA to enter this information and label the spreadsheet with the PEIMS course number and title. Do not delete any columns (even if not used), as this information will be merged into the study database. In some cases, as noted below, information regarding students not participating in the virtual classroom (but who are enrolled in an equivalent traditional class) will be requested. Limit comparison students to no more than 20 (sample – if you need help deciding on a sampling approach, contact the study team) or actual enrollment if less than 20. This information is requested in only a few instances. Remember that to the greatest extent possible, TEA will merge PEIMS data that are available within the time requirements of this study. If you have an alternative method for conveying these data, please contact David Stamman at aimdata@earthlink.net.

1. PEIMS identification number (please double check for accuracy)

2. Scrambled student identification (leave blank– TEA will fill this in.)

3. Virtual Student (used only when there is sample of non-virtual students included) Y or N

4. PEIMS Code for course

5. Course Name

6. Year-long course? Y or N

7. Course Completion Code* (*see Note 1 below*)
   1-abandoned the course within first 4 weeks
   2-abandoned the course before completion
   3-completed course, but did not pass final examination (no credit)
   4-successful completed the course (at least a C grade and completed any additional requirements.)

8. How long did the student take to complete the course (in weeks), enter only for students with a code 3 or 4 in Question 7.

9. The numeric grade received in the course (for elementary, note a grade as follows 1-A, 2-B, 3-C, 4-F)

10. The overall grade point average (when applicable) for students taking the courses prior to the 2001-2002 school year* (*see Note 1 below*)

11. How many credit hours prior to the 2001-2002 school year?

12. Was this student promoted to the next grade level?
    1-Yes
    2-No
    3-Placed in next grade level

13. Has this student unsuccessfully attempted this course before in a regular classroom?
    1-Yes
    2-No

14. What percentage of the course work was in a virtual setting?

15. If the student has attempted this course before, what was the outcome?
    1-abandoned the course within first 4 weeks
    2-abandoned the course before completion
    3-completed course, but did not pass final examination (no credit)

16. Approximate percentage of courses in a semester that are electronic courses.

17. Results from the Texas Tech test (grade 1 and 2 only)

* Note 1. TEA will request this information for a sample of students taking the same (or equivalent) course in a regular instructional setting. These arrangements will be made on an individual provider basis.

Costs and Finance of Electronic Courses

District/Charter School Name_____
District/Charter School Number_____-_____-_____

Your name_____ Contact number or e-mail_____

Please complete as much of this questionnaire as you can and mail it back to Catherine Clark in the envelope provided. If you have questions about this instrument, you can reach Catherine Clark at Catherine.clark@mail.utexas.edu or 512-232-9207.

1. Do you purchase electronic courses from another school district or a vendor (through a purchase agreement or a license)? (yes or no)_____ Please answer 1.1, 1.2, and 1.3 below if your response is "yes."

   1.1 From which vendors or districts have you purchased courses this school year?

   1.2 How are the courses priced? (Is the price based on the number of students served? On the number of computers in the school or district? Some other arrangement? If you use more than one vendor, let us know the arrangements for each vendor)

   1.3 What is the per-student cost of a one-year (or one credit) electronic course? If you offer more than one course that was purchased or licensed, please estimate the per-student cost for each course. (Do not include the cost of equipment or Internet connections, just the cost of purchase or license.)

   _____ _____

   _____ _____

   _____ _____

   _____ _____ use reverse side for more courses

2. Do you develop your own electronic courses? (yes or no)_____ Please answer 2.1 through 2.4 below if your answer is "yes."

   2.1 Is the developer on the staff of the district or charter school?____

   2.2 Is the developer a contract employee?_____

   2.3 How is development funded?

   2.4 What is the approximate cost of developing one electronic course?_____
   (Consider the cost of developing the content, the software, the design of templates, the cost of developing discussion boards, etc. Don't include the cost of teaching the course, just development costs. If the cost varies by type of course, please estimate the development cost of different types of courses. Use the reverse side if you need additional space.)

For questions 3 through 7 below, consider the annual ongoing costs of all the electronic courses you offered in 2001-02. Your answers may be estimates based on current experience.

3. About what percentage of the total annual cost of electronic courses goes to support direct instructional services? (Think, generally, about expenditure function 11 expenditures for purchasing or licensing the course, the instructor or teachers, supplemental materials such as textbooks or consumable supplies.)

4. About what percentage of the total annual cost of offering electronic courses goes for general administrative support? (Think, generally, about expenditure function 41. The percentage for administration may be the same as or very similar to that applied to traditional courses.)

5. About what percentage of the total annual cost of offering electronic courses goes for technical equipment and support? (Consider the cost of maintaining the equipment, maintaining the student database and passwords for course administration, the cost of electronic connections and utilities, the annualized cost of a server, etc. If your district considers these as "administrative" costs (item 4 above), please note this below so we don't double count our estimates.)

6. Are there annual training costs for teachers or staff associated with electronic courses? ____ If so, what is the approximate annual cost of this training per person trained?

7. What other ongoing costs are associated with electronic courses in your district or charter school? (For example, you may have costs associated with maintaining the content of some electronic courses.)

The five questions above focused on ongoing costs. The next question is about one-time costs

8. List or describe the one-time costs for electronic courses you offered during 2001-02.

Questions 9 through 11 pertain to the cost of supplies and equipment for electronic courses such as desktop computers, laptops, printers, equipment service contracts, computer desks, toner, paper, security systems for rooms in which equipment is stored, etc.

9. Does your district or charter school supply equipment for students to use for electronic courses? _____ Please answer 9.1 and 9.2 below if your response is "yes."

    9.1 What were the total supply and equipment costs associated with electronic courses this school year? If you can do so, please separate the cost for hardware (servers, desktop computers, laptop computers), software, desks and furnishings, and supplies like paper and toner.

    9.2 How many students were served by the supplies and equipment indicated in question 9.1?

10. Did the district or charter school make any loans of equipment to students for them to use in their homes? _____ Please answer 10.1 and 10.2 below if your response was "yes."

    10.1 Were there losses or any damages? _____

    10.2 Does the district or charter school have a policy to charge a fee for damaged and lost equipment? ____ Does this policy apply to non-electronic courses and electronic courses in the same way? _____ (If you answered "no" explain how the policy is applied differently for electronic courses.

11. If your district or charter school does not supply equipment for students to use for electronic courses, what do you do to assure equitable access to electronic courses for all students?

12. What is the primary source of funds for electronic courses in your district?

13. Were there any internal or external partnerships or other sources of financial support for the cost of electronic courses? _____ If so, please identify the partnership or source of financial support.

14. Did your district seek a waiver to support electronic courses?_____(Answer 14.1 and 14.2 below if your response is "yes.")

    14.1 What waiver or waivers were requested?

    14.2 Did TEA grant the waiver or waivers?

15. Did your district or charter school encounter any problems reporting finance, attendance or staffing for electronic courses through the PEIMS system?____ If your answer is "yes," please list or discuss the problems.

16. How can PEIMS reporting be changed or improved to better account for electronic courses and any associated equipment?

17. Can you recommend changes to the state's funding formula that might better support electronic courses and virtual learning programs? (Please use the reverse side of this page to explain in full.)

Thank you for taking time to complete this data collection form.

Please return this form in the envelope provided. Or, you may fax the information to "Electronic Courses Study" at 512-232-1855 or mail it to the Dana Center, 2901 North IH-35, Austin, TX 78722.

Technology Issues

District/Charter School Name_____

District/Charter School Number_____-_____-_____

Please complete this form for the electronic courses offered through the TEA pilot program. If the responses are the same for all the pilot program courses, you may use one form (be sure to indicate all the PEIMS ID numbers, however). If there is variation from course to course, please copy this form and use a separate form for each course approved for the pilot program. If you need additional space to answer a question, you may write on the back of the form or attach a separate page.

If you have questions about the instrument, please contact Barbara Speer at (512) 418-8379 or barbaraspeer@sdsm.com.

Course Name and PEIMS ID number _____

1. What technology (versions of browser, type of operating system, and type of hardware) was required for the course?

2. Does a lack of access to technology (e.g. Internet access or hardware) impact the number of students who are able to take these courses?

3. Describe the measures taken to ensure that students without a home computer or Internet access were given the opportunity to participate in the program. Please include arrangements such as transportation associated with ensuring access.

4. What technology would improve the effectiveness and efficiency of these courses? (This assumes you do not currently have access to this technology.)

5. If students are taking the electronic courses in school facilities, please describe the layout (e.g., is there an area reserved for these students, using an existing lab when not being used by a class, etc.).

6. Was technical support (e.g. coursework or hardware) available? How useful was it?

7. What authentication methods (e.g., biometric, physical monitor, parental verification, etc.) were used to verify student attendance? Class participation? Course completion? If biometrics methods were not used, did you consider using them?

8. What types of Internet connection are required for access (e.g., dial-up, DSL, cable modem, LAN connection)?

9. Did you face any security or privacy issues (e.g., letting students behind the firewall, social security numbers on the Web, etc.)?

10. Please note any other comments regarding technology.

Appendix C

Technology Requirements for Students to Access Online Courses

Appendix C: Technology Requirements for Students to Access Online Courses

District	Description of Technology Requirements including hardware, operating system and browser requirements.
Allen ISD	❖ Internet Explorer (version 5.5 with service pack 1 or 2 installed, or version 5 for Macintosh) or ❖ Netscape Communicator 4.7x ❖ Note: The built-in AOL Browser, and Netscape or IE version 6 are not supported.
Amarillo ISD	❖ Windows – Pentium Processor, Windows 95 or higher ❖ Mac – PowerMAC, OS 8.5 or higher, ❖ All-64 MB RAM ❖ Color monitor ❖ Modem ❖ Sound card ❖ Speakers ❖ Navigator 4.74 or IE 5.0 or higher
Austin ISD	❖ PC/laptop with 55 megabytes per 12 connections ❖ Internet access ❖ 64 MB RAM
Birdville ISD	❖ PC with 90MHz Pentium Processor and Windows 95 or higher, ❖ 32MB RAM and hard disk with 40MB available ❖ Monitor with 800 x 600 display resolution ❖ 4x CD-ROM drive (8x recommended) ❖ 28.8K modem (higher recommended) and Internet access ❖ Sound card and speakers ❖ Real Player Basic ❖ Browser (Netscape or Microsoft Explorer) ❖ Printer
Duncanville ISD	❖ PC with Pentium Processor and Windows 95 or higher, or Macintosh with Power PC processor and System 8.5 or higher ❖ 64MB RAM and hard disk with 40MB available ❖ Color monitor ❖ 8x or faster CD-ROM drive ❖ Network connection or 56K modem with Internet access ❖ Sound card and speakers ❖ Browser (Netscape Communicator 4.61 or higher or Microsoft Internet Explorer 5.0 or higher)
Harris County Department of Education Cooperative	❖ Browser (Netscape or Microsoft Explorer)
Houston ISD High School and Houston ISD Virtual Middle School	❖ Multimedia computer with 80MB hard drive space ❖ Sound card, speakers, video card (4MB onboard RAM) ❖ CD-ROM drive and printer ❖ Internet access with 56K speed modem ❖ Windows 95 or NT workstation 4.0 or Macintosh OS 8.x ❖ E-Mail ❖ Internet Explorer 5.0 ❖ Microsoft Office 97 or WordPerfect Office 2000 ❖ RealPlayer software ❖ Adobe Acrobat 4.0

Magnolia ISD	❖ PC with Pentium Processor and Windows 95 or higher, or Macintosh with Power PC processor and System 8.5 or higher ❖ 64MB RAM and hard disk with 40-50MB available ❖ Color Monitor (800 x 600 resolution) ❖ 8x or faster CD-ROM drive ❖ Network connection or 56K modem with Internet access ❖ Sound card and speakers ❖ Browser (Netscape Communicator 4.61 or higher or Microsoft Internet Explorer 5.0 or higher with plug-ins) ❖ Mouse and keyboard
Plano ISD	❖ PC with Pentium Processor and Windows 95 or higher, or Macintosh with Power PC processor and System 8.5 or higher ❖ 64MB RAM and hard disk with 40MB available ❖ Color monitor (16 bit, 800 x 600 resolution) ❖ 8x or faster CD-ROM drive ❖ Network connection or 56K modem with Internet acces ❖ Sound card and speakers ❖ Netscape Communicator 4.61 or higher or Microsoft Internet Explorer 5.0 or higher and course-specific plug-ins for the browsers ❖ Microphone (English as Second Language or Spanish courses) ❖ Printer (recommended)
University Charter School	❖ PC with 166 MHz processor and Windows 95 or higher, or Macintosh 120 MHz Power PC with OS 8.1 system or higher ❖ Internet connection ❖ Sound Card, Speakers and/or headphones ❖ CD-ROM drive ❖ 32 MB RAM ❖ Printer

Source: 2001-2002 TEA Study of Electronic Courses and Virtual Learning Programs surveys

Appendix D

Resources for Online Course Quality Guidelines

Appendix D: Resources for Online Course Quality Guidelines

***Distance Education Guidelines for Good Practice* by The Higher Education Program and Policy Council Of The American Federation of Teachers**, May 2000
This report is a set of standards for good practice in distance education targeted at higher education.
http://www.aft.org/higher_ed/downloadable/distance.pdf

***Guiding Principles for Distance Learning in a Learning Society* by The American Council on Education and The Alliance: An Association for Alternative Programs for Adults**, 1997
A national task force created this document as a guide for learners and assessors of learning quality in formal distance education programs.
http://www.acenet.edu/calec/dist_learning/dl_principlesIntro.html

***Development of Standards or Criteria for Effective Online Courses* moderated by David L. Little**, June 1999
This is a summary of an online discussion in which participants were invited to comment on the development of criteria or standards for online courses in today's educational setting.
http://ifets.ieee.org/periodical/vol_3_99/formal_discussion_0699.html

***Quality on the Line*, An Institute For Higher Education Policy Study commissioned by the National Education Association and Blackboard, Inc.**, March 21, 2000
This study identified benchmarks for online teaching from practices being used by colleges considered to be leaders in online distance education.
www.ihep.com/PR17.html

***Principles of Good Practice* by the Southern Regional Education Board**, January 1998
A set of standards whose purpose is to identify the expectations and requirements for participation in the SREB's Electronic Campus.
http://www.electroniccampus.org/student/srecinfo/publications/Principles_2000.pdf

***Essential Principles of Quality* by the Southern Regional Education Board**, January 2001
This checklist is based on the SREB *Essential Principles of Quality* and is designed to assist states and schools in determining the quality and effectiveness of Web-based courses.
http://www.sreb.org/programs/edtech/pubs/PDF/Principals_of_Quality_Checklist.pdf

***State Standards for Distance Education* by the Louisiana Department of Education**, October 1999
This document is a framework for developing and implementing quality distance education programs based upon learning, research, dialogue and practice.
http://www.doe.state.la.us/DOE/lcet/curric/disted.pdf

***Criteria for Benchmarking Standards* by Achieve**
This document details objective, measurable criteria Achieve uses in benchmarking state academic standards.
http://www.achieve.org

***VHS Course Evaluation Effort* by the Virtual High School**, 1998
This document shows the evaluation instrument used by the Virtual High School to evaluate each course as the course moves from design to implementation.
http://vhs.concord.org/Content/Main+Office-Course+Evaluations

Michigan Virtual High School Course Standards
This chart shows a continuum used to gauge interactivity, content, instructional design and delivery, and assessment in online courses.
http://www.mivu.org/mivhs/Policies/course_standards.htm

***Online Education: New Paradigms for Learning and Teaching* by Greg Kearsley**, August 1998
This article in The Technology Source describes some of the salient characteristics of outstanding online courses, the issues they raise about online education, and the apparent direction of online education in higher education.
http://ts.mivu.org/default.asp?show=article&id=73

Appendix E

K-12 Web Instructor's Certification

Appendix E: K-12 Web Instructor's Certification

Distance Education, in the form of online learning, is taking its position in the K-12 classroom. Though never to replace the traditional school, it provides a needed setting for unique educational circumstances. To ensure the success of K-12 students, educators will have to rethink established teaching methods.

In order for students to succeed, adjustments must take place when presenting curriculum to students online. Communication must develop among the learner, instructor and campus mentor. Such changes require intensive training of Web-based teachers, proper orientations for online students, and appropriate preparations of campus liaisons. Region IV Education Service Center has designed and overseen the development of appropriate training for three groups consisting of online teachers, online students and campus liaisons. These Web-based Triads forms a system that will help to ensure student success.

Web Instructor's Certification Course:

It is vital that teachers, an important component of the triad, be properly equipped to meet unique challenges when faced with teaching in a Web-based environment. The **Web Instructor's Certification Course** is designed to prepare teachers for the unique experience of teaching online. It is founded upon and supported by current distance education research and theory. The **Web Instructor's Certification Course** supplies professional development, which focuses on mastering skills needed to be successful in the asynchronous classroom. The course is presented in two parts and is designed to be completed within a six-week period. The main goals are:

1. **Online Experience** – Instructors who teach students online require a first-hand understanding as to what their students will experience when committing to this special instructional environment.
2. **Modeling** – It is essential for educators to learn quality Web-based teaching techniques through participation and observation.
3. **Instructional Design** – It is critical for teachers to obtain skills in designing, in writing and in developing pragmatic content for the Web-based classroom.
4. **Practical Outcomes** – Upon completion of this course, teachers acquire a variety of practical lessons to implement online.

Part I, *"How to Teach Online,"* gives techniques and strategies for teaching online. Through observation and modeling, teachers will learn methods and experience communications with students using a Web-based interface as the primary tool.

Course Description:

In Part I of this two-part course, participants will probe into techniques of how to teach successfully online. Instructional units include the following:

- Introduction to Online Interface (i.e. Blackboard, WebCT, etc.)
- Introduction to Distance Learning
- Interactive Strategies and Activities
- Online Communication and Motivation
- Writing for the Web
- Learning Styles
- Assessment and Evaluation

Part II, *"How to Develop Online Course Materials,"* expands the teacher's understanding of instructional design components for developing high-quality Web-based lessons. It is imperative that online subject matter be clear, concise and uncomplicated to navigate. This section of the course guides participants through logical progressions of instructional design processes. It leads to experiences with systematic steps in analyzing, designing, developing, implementing and evaluating Web-based lessons and units.

Course Description:
In Part II of this course, participants will be able to do the following:

- Complete a basic needs assessment
- Prepare a course syllabus
- Write an orientation/welcome letter
- Identify missing curriculum components
- Write specific goals, terminal and performance objectives
- Develop an interactive lesson plan

Online Student Orientation:
This one-week mini-course helps to screen students who may have needed proficiencies to succeed within the online environment. The course diagnoses potential technical problems, such as firewalls, which can be attended to before students begin their online courses. It also prepares potential students to meet the challenges of the online classroom by helping them learn basic course requirements.

Campus Liaison:
This two-week mini-course addresses the virtual space between the online student and the online instructor. The curriculum provides campus liaison with specific skills required to use while working in conjunction with both online teachers and their students. The role of the campus liaison is considered to be the missing link of the triad for assuring student success in Web-based instruction.

Recommendations:
Because of this exceptional teaching and learning environment associated with online learning, it is recommended that all teachers be placed in a Web-based teaching situation with appropriate preparation. In order to ensure suitable training is established, all potential Web-based teachers must be certified through an intensive training such as the **Web Instructor's Certification Course.** This process ascertains teachers receive consistent guidance in using effective instructional strategies distinctive to asynchronous teaching.

Appendix F

Technology to Improve Texas Education: Benchmarks and Actions for e-Learning

Appendix F
Technology to Improve Texas Education
Benchmarks and Actions for e-Learning

CORD and Concord Consortium (2001) in Technology to Improve Texas Education highlight that Texas must act now (2001) to refine goals and redirect resources, or the opportunity for a brighter future through education will fade. This report presents specific recommendations and describes the benchmarks and actions associated with the recommendations. The recommendations focus on four areas:

1. Professional development, particularly professional development delivered via the Internet
2. Web-based content and tools
3. Hardware, connectivity and technical support
4. Accountability

The researchers recommend that the Texas Legislature take action now to address needs in these four areas. The resulting system will go a long way toward providing a high-quality education to all Texas children.

Summarized recommendations and benchmarks follow:

Recommendations and Benchmarks (from CORD and Concord Consortium, 2001) (pp. 38-44):

I. Finding: Realization of the potential of information technology in Texas schools will require a major effort in professional development.

Recommendation 1—Teacher professional development:

a. That the Texas Legislature direct agencies and allocate funds to develop programs and institute standards and assessments necessary to establish a statewide professional development system capable of ensuring that by 2008 all teachers in Texas public schools will be using information technology effectively and efficiently in their teaching (priority should be given to professional development delivered via the Internet)
b. That every teacher be provided with a laptop computer and connectivity to the Internet. The proposed budget to accomplish this recommendation is $441 million over the next six years.

Benchmarks
By the year 2008—Every school district will have an information technology professional development plan as part of its district- and campus-improvement plan.

a. All entering teachers will begin teaching at Level II or higher on the Texas STaR Chart.
b. 70% of teachers will be at Level III or higher on the Texas STaR Chart.
c. 20% of teachers will be at Level IV on the Texas STaR Chart.

Actions Recommended by CORD and Concord Consortium in 2001

1. In 2001, the Legislature will form a Legislative Interim Committee to examine the research from Preparing Tomorrow's Teachers to Use Technology (PT3) grants in Texas and around the country and , on the basis of that examination, propose policies to cause systemic change to achieve technology proficiency in preservice programs in colleges of education.
2. Beginning in 2001, the Legislature will increase the Technology Allotment by $5 per student and require that each district spend at least that amount on information technology professional development until such time as the district has attained the benchmarks identified above.
3. The State Board for Educator Certification will establish standards for Technology Applications certification and create the ExCET test for this certification as soon as possible. Until that is done, no programs for this certification should be approved.

4. In 2001, the Legislature will call for the State Board for Educator Certification to create a Master Technology Teacher designation, similar to the Master Reading Teacher designation. Completers of the requisite training for this designation would receive additional stipends of $5,000 in return for mentoring other teachers and serving related roles, especially on high-need and /or low-performing campuses ($200/teacher/year x 7 years)
5. Beginning in 2002, the Legislature will require that every district have an information technology professional development plan as a part of its district- and campus-improvement plan.
6. Beginning in 2002, the State Board for Educator Certification will administer a grant program for university schools of education, aimed at Web-based instruction for Alternative Certification Programs focused on bringing teachers to poor and rural areas of the state with math and science as a priority. The grants will be targeted toward partnerships between the public and private sectors.
7. Beginning in 2002, TEA will implement the Texas STaR Chart with specific benchmarks for professional development each year from 2002 to 2008.
8. Beginning in 2002, the Legislature will create a four-year Teacher Investment Program to provide every teacher with a laptop computer. The Legislature will provide $25 million per year (50,000 teachers per year ◊ $500 or 25,000 teachers per year ◊ $1000) that TEA will distribute based upon each district's information technology professional development plan; priority will be given to rural districts.
9. Beginning in 2002, the Texas Teacher Appraisal System will be modified to include a measure for proficiency in integrating information technology into teaching and learning. The measure will be tied to standards and include a built-in assessment system.
10. Beginning in 2003, the Legislature will provide an additional $20 million per year to TEA for information technology professional development programs for capacity building and increasing and improving information technology professional development, especially in rural areas. Priority for this initiative will not be for teacher release time or additional teacher inservice days; it will be for professional development delivered asynchronously, online.
11. Beginning in 2003, the Legislature will appropriate $10 million each year over four years to create a grant program, similar to Telecommunications Infrastructure Fund (TIF), for colleges of education, to ensure that the institutions are fully equipped with the technology and connections necessary to fulfill their roles in achieving the goal of technology proficiency in preservice programs. This grant program should be short-lived and serve only as a "jump-start." Institutions of higher education should begin now to budget for the upgrades and replacements necessary to keep their technology current and their faculty members up to date.

II. Content and Tools (from CORD and Concord Consortium, 2001)

Finding: Realization of the educational benefits of information technology requires an adequate supply of online content and high-quality tools and mechanisms for applying those materials and tools to the teaching and learning process. The Web contains useful content and tools, but there is still a need for new tools and materials that specifically support the Texas Essential Knowledge and Skills (TEKS) and AP courses.

Goal: To ensure that by 2008 all teachers and students will have access to the best available online content and tools and the best available information on how to use online materials effectively. The proposed budget to accomplish this recommendation is **$113 million** over the next six years.

Recommendation 2—Content and tools: That the Texas Legislature provide resources for TEA to:

a. Undertake or authorize *research on existing* online content and tools in all available forms (text, video, interactive simulations and others) to determine what materials can be used to support the TEKS and the study of required and AP courses in all academic areas
b. Undertake or authorize *development of new* online content and tools (by state institutions, nonprofit entities or commercial textbook publishers) that support the TEKS and the study of required and AP courses in all academic areas
c. Establish a clearinghouse of information pertaining to information technology-specific lessons learned, best practices and lesson plans

Benchmarks: By the year 2008—

a. Every Texas teacher and student will have access to the best available online content and tools and access to information on how those materials support the TEKS and the study of Texas history and culture.

b. Every textbook adopted in Texas will be available in both print and digital forms or will be accompanied by or coordinated with adequate online and other digital materials that support and encourage the latest and most effective teaching and learning practices.
c. Every Texas teacher will have access to the best available online information on information technology-specific lessons learned, best practices and lesson plans. This information will reflect the experiences and expertise of educators across the country (see extensive information than is provided by the Teachers' Tool Bag section of the TEA web site and by the TEKStarnet web site http://www.ednet10.net).

Actions Recommended by CORD and Consortium in 2001

1. TEA will investigate available online content and tools and will compile a hyper linked online catalog of those materials, indexed according to their application to the TEKS and to AP courses.
2. TEA, state institutions and nonprofit entities will develop TEKS-indexed online content and tools for required and AP courses in all academic areas.
3. TEA will provide guidelines to commercial textbook publishers for developing: a.) TEKS-indexed online versions of their textbooks; b.) Online materials that are coordinated with the textbooks; and /or 3.) Contextual teaching and learning practices. Online materials should not be optional supplements but should be integral components of the courses in which the textbooks are used.
4. TEA will conduct research nationally on lessons learned, best practices and lesson plans and will establish an online clearinghouse for making this information available to Texas teachers.

III. Connectivity, Hardware and Technical Support (from CORD and Concord Consortium, 2001)

Findings: Realizing the potential of information technology in Texas schools will require widespread connectivity—connectivity *to* the vast resources of the Web and *among* all participants in the educational process (many of whom are not affiliated with schools) and the hardware and technical support necessary to maximize the usefulness of the connections.

Recommendation 3—Connectivity, hardware and technical support

That the Texas Legislature fund the purchase of hardware and Internet connections and fund technical support sufficient to ensure that by 2008 all Texas educators and students have access to fully supported broadband capability, 24X7. The proposed budget to accomplish this recommendation is **$880 million** over the next six years.

Benchmarks: By the year 2008—

a. The student-to-Internet-connected-device ratio will be 3:1 or lower.
b. All educators will have their own laptop computers or other Internet-connected devices. (This benchmark is met through Action 4 under Recommendation 1; see p. 39.)
c. The broadband capability of every district will be sufficient to allow every student and educator in the district to access online, full-motion video simultaneously.
d. Every district will have technical support and backup equipment sufficient to ensure that no educator or student is denied access to the Internet for more than 24 hours at a time.

Actions Recommended by CORD and Concord Consortium in 2001

1. In 2002 TIF will create a plan and a schedule for subsidizing the deployment of broadband to schools. (The plan and schedule will be the sole focus of TIF; all concerns regarding professional development and other activities within the walls of the schools are the purview of TEA.) The plan and schedule will be created to take full advantage of the E-Rate and other federal programs, be fully coordinated with TEA's activities and provide first priority to rural and economically disadvantaged areas of the state.
2. Beginning in 2002 the Legislature will create a $140-million-a-year Student Empowerment Fund that lasts for five years and is administered by TEA. (This fund is in addition to the Technology Allotment Fund.) The purpose of the fund is to ensure that districts are able to reach the benchmark described above. TEA will ensure that districts have sufficient planning and professional development in place to take the best advantage of the fund. The highest priorities for the fund will be rural schools and schools in economically disadvantaged situations.

3. By 2003 each district will ensure that the information technology component of its district and campus improvement plan contains a schedule and funding for updating or replacing devices over a three-to-five-year time frame.
4. In 2002 TEA, in conjunction with the Texas Department for Information Resources (DIR), will establish a clearinghouse for research and information on new and emerging technologies that are applicable to public education.
5. In 2001 TEA will convene a working group of educators, business people and information technology experts to find creative solutions to problems stemming from the need for— and enormous potential cost of—technical support. This study should investigate a series of topics that could include the following: the levels and types of technical support required by schools; the most appropriate sources of technical support; the types of training required by school-based technical support personnel; funding sources to cover the cost of technical support and specialized training; approaches to state and district contracts for hardware and the extent to which technical support and training can and should be bundled with the hardware; and ways in which technical support can be supplied by students.
6. Beginning in 2002, TEA will fund the technical support for schools to maintain computers, networks and software/courseware according to the solutions determined in Action 5 above.

IV. Evaluation of Benchmarks, Actions and Successes (from CORD and Concord Consortium, 2001)

Recommendation 4—Evaluation

That Texas put in place an educational technology evaluation process that evaluates the effectiveness of its use of information technology on a continuing basis. The first phase of the evaluation should last five years; by 2006, the Texas education system will have clear evidence of the results of expenditures on technology, based on an annual benchmark review. The system will be evaluated not on the basis of whether it leads to an increase in the use of technology in education but on the basis of whether it contributes to *measurable academic gains*.

The proposed budget to accomplish this recommendation is **$11 million** over the next six years.

Appendix G

Additional Resources

Appendix G
Additional Resources

Investigating Quality of Online Courses, TEA 2000

http://www.iq standards .info/resources.htm

This web page provides various links to support the work of Phase I of the Investigating Quality of Online Courses (IQ) project in which online courses were evaluated in order to develop standards for these offerings in Texas. This project delivered a set of standards to assure to Texas schools that Internet courses meeting these guidelines are of the highest quality. These standards were developed because no procedures are in place to determine if any of these online products meet the needs of Texas' students, teachers and schools.

TEA established the IQ Pilot project and contracted with Region IV ESC's Distance Education Services Department to administer it. Stakeholders invited to participate in the IQ Pilot include: regional education service centers (ESCs), independent school districts, state universities, distance education organizations and businesses. The purpose of this project: is to establish and pilot quality-of-service guidelines for online courses to provide assurance to the state, school districts and campuses that courses meeting these guidelines will be of the highest quality in all respects and that they address student achievement and academic excellence.

Objectives for Phase I included the development of *Quality of Service Guidelines* and checklist to serve as a measurement tool for evaluating courses against the set of standards and a pilot to validate the guidelines developed. The following areas were addressed:

- Administrative Reports
- Content
- Economics
- Evaluation
- Instructional Design
- Integration of Technology
- Marketing
- Professional Development
- Student Support
- Technical Support

Phase II was conducted in spring 2002. Reviewers were selected based on their expertise in their content area and their demonstrated level of expertise in teaching or evaluating Internet-based courses. Evidence of expertise in this area included one or more of the following: Texas Virtual School Instructor's Certification, Region IV ESC Web Instructor's Certification, experience teaching one or more online courses to K-12 students, experience evaluating Internet-based courses. The purpose of this review was to validate the guidelines developed in Phase I. Courses to be reviewed included math, science, social studies, English/Language Arts and those in the enrichment curriculum. The review was to test the validity of the guidelines, database and reporting formats.

Mood, Terry Ann, 1995

Mood, Terry Ann, 1995. Distance Education an Annotated Bibliography. Englewood, Colo.: Libraries Unlimited Inc. http://www.netLibrary.com/urlapi.asp?action=summary&v=1&bookid=21906 e-book accessed 10/11/02.

This annotated bibliography is intended to help teachers who must adapt their teaching styles to the conditions of distance education; administrators address the difficulties of managing a program whose students may be thousands of miles away; and students study and learn in settings away from the traditional classroom environments. The book is concerned with pedagogical issues. Annotated bibliography is organized around the following elements of distance education: History and philosophy, management and administration, teachers, students, special groups served and international developments.

The index (author and title) can be searched electronically by author, title or subject.

Lau, Linda K., 2000

Distance Learning Technologies: Issues, Trends and Opportunities. London: Idea Group Publishing, Salomon Smith Barney, Inc., <http://emedia.netlibrary. com/reader/ reader. asp? product id=42256> e-book accessed 10/11/02 (<www.lib.utexas.edu> University of Texas at Austin online resources)

In 1991, the World Wide Web (WWW) was conceptualized at the European Particle Physics Laboratory (CERN) in Geneva, Switzerland, with the sole purpose of making research findings and scientific materials available to the academic and scientific community on a global network. Since then, the Internet has become an important communications medium for both giant corporations as well as individuals and lately, as an innovative instructional and distance learning tool for academic institutions. Actually, distance learning was pioneered at Stanford University more than 30 years ago to meet the increasing demand for high-tech engineers and computer scientists at Silicon Valley. According to this book, nontraditional bachelor's and master's distance learning programs are offered by more than 150 accredited academic institutions in the US. According to the United States Distance Learning Association (USDLA), an organization committed to promoting and developing distance learning, there were no significant differences in effectiveness between distance learning and the traditional learning techniques. This book was written to provide both academicians and practitioners with a body of knowledge and understanding regarding the distance learning technologies.

This book is divided into three sections. The first four chapters provide the theoretical foundation of distance learning. The second section describes the conceptual aspect of distance learning in seven chapters. The final section of the book provides five cases of practical implementation of distance learning. The book covers a variety of practices of Web-based instruction systems (WBIS) from a systems perspective, describing its components and interfacing technologies, critical problems, issues and taxonomy for classifying the various types of WBIS. This book focuses on university-level education and industry with need for distance learning technologies (for example, implementing corporate distance training using change management, strategic planning and project management).

Among the most important issues are: a new way of restructuring education away from a traditional classroom perspective, which requires new curricula, new staffing training, new design of online instruction, learning environments with technological support (e.g., digital video) and new certification. Various authors evaluate the training requirements of the network marketing industry, based upon the industry needs and availability of training resources. The book is an anthology compiling about 30 articles evaluating a diversity of successful programs already in place.

Western Cooperative for Educational Telecommunications

http://www.wiche.edu

WICHE works with its 15 member states to assure access and excellence in higher education for all citizens of the West. Several programs extend its reach nationally and internationally.

http://www.wiche.edu/Pubs/detail.asp?id=136 Accessed 10/11/02.
Distance Education, A Consumer's Guide: What Distance Learners Need to Know 2A300, 12 pp., 1997.

This is a primer on distance education for prospective distance learners. It emphasizes the questions to ask of distance education programs a student might be considering and points to some pitfalls to avoid. The "Principles of Good Practice in Electronically Offered Academic Degree and Certificate Programs" are included. The booklet answers the following questions from a consumer's perspective:

- What is distance education?
- Who are distance learners?
- Where do I begin?
- How do I choose a school?
- How do I evaluate quality?
- What is accreditation?
- Even if a school is accredited, how do I make sure its electronically offered programs are of high quality?
- How do I evaluate a program from a school that is not accredited?
- What is the best technology to use?
- Making a decision
- For more information: some published guides
- Resources on the Internet
- Higher education regional accrediting bodies

Technology Costing Methodology

http://www.wiche.edu/wcet/projects/tcm/ Accessed 10/11/02.

Western Cooperative for EducationalTelecommunication's (WCET)TCM is funded by the U.S. Department of Education's Fund for the Improvement of Postsecondary Education and it is an authoritative costing analysis tool, including standard definitions of cost categories, for institutions and multi-institutional agencies to: a.) Analyze the costs of instructional approaches that make heavy use of technology; and b.)To legitimately compare cost data for different instructional approaches.

SREB's Distance Learning Policy Laboratory

http://www.electroniccampus.org/policylab/index.asp Accessed 10/11/02.

SREB's Distance Learning Policy Laboratory is funded by the U.S. Department of Education's Fund for the Improvement of Postsecondary Education and seeks to reduce or eliminate existing or potential policy barriers to distance learning activities in three broad areas: access, quality and cost.

Priority Policy issues-The Policy Laboratory http://www.electroniccampus.org/policylab/docs/initiatives.asp aims to establish pilot projects in conjunction with its LAAP State Partners in order to reduce educational barriers. Partners are working with the Policy Laboratory members to plan approaches for piloting and testing new strategies in targeted policy areas.The LAAP Partners also serve as a central point of contact for those participating in pilot programs in their respective states. Through active communication with several state, regional and national agencies, the Laboratory outlined a number of major barriers to distance learning. In-depth interviews with higher education policy and distance learning experts replicated and expanded the initial findings, resulting in a set of broad policy areas, which were then reviewed and sanctioned by the Policy Laboratory Leadership Group.The following nine policy areas have been targeted to be addressed by the Laboratory (the page cited above provides links to the various documents for each of the policy issues below):

- Financial issues, including traditional funding models and budget allocation practices
- Faculty issues, including faculty assessment, skill development, reward structures and intellectual property issues
- Student issues, including credit transfer, credit "banking," and student services for the distance learner
- Tuition differentials between in- and out-of-state students
- Quality assurance
- Financial aid for distance learners
- Reaching underserved populations
- Coherence and values in distance learning

University of Idaho, 2001

University of Idaho Engineering Outreach, 2001. Distance Education at a Glance. http://www.uidaho.edu/evo/distglan.html

In order to help teachers, administrators, facilitators and students understand distance education, Barry Willis, the Associate Dean for Outreach and the Engineering Outreach staff present the following series of guides developed by Barry Willis and the University of Idaho Engineering Outreach staff highlighting information detailed in Dr. Willis' books, Distance Education - Strategies and Tools and Distance Education - A Practical Guide. Other guides in this series include:

1. Computers in Distance Education
2. Copyright and Distance Education
3. Distance Education and the WWW
4. Distance Education: An Overview
5. Distance Education: Research
6. Evaluation for Distance Educators
7. Glossary of Distance Education Terminology
8. Instructional Development for Distance Education
9. Instructional Television
10. Interactive Videoconferencing in Distance Education
11. Print in Distance Education
12. Strategies for Learning at a Distance
13. Strategies for Teaching at a Distance

Distance Learning Resource Network

The distance learning resource network [(DLRN) http://www.dlrn.org/] is the dissemination project for the US Department of Education Star Schools program. The Star Schools projects deliver distance education courses and services using many technologies including satellite delivery systems, open broadcasts, cable and the Internet.

Example of a Digital Classroom

Kevin T. McNulty, 2002. Fostering the Student-Centered Classroom online. T.H.E. Journal online: Technological Horizons in Education. Feb. http://www.thejournal.com/ magazine/vault/A3855C.cfm Accessed 10/11/02.

McNulty argues that the online classroom's greatest potential lies in its ability to help the teacher create a truly student-centered classroom. The three elements that make up the classroom web site for the class all work to move the students into the center of their educational journey, making them the *maestros* of their education and their lives.

Example of Faculty Online Support

Universal Class from UT Austin. http://universalclass.com/arts/english/index.htm?g=51949. Accessed 10/11/02.

This web site is dedicated to all classes and includes the following state of the art features: online syllabus development and use, online scheduling, real-time chat, threaded discussions, file sharing, online study groups, test generation, online grading, grade book accounting, e-mail alerts and more.

The site also allows you to freely upload your resume/curriculum vitae, conference announcements, job postings and other information in English at the University of Texas Austin. The site is accessible to all faculty and students at colleges and universities around the world.

Appendix H

On Virtual High Schools

Appendix H
On Virtual High Schools[39]

McClanahan, Gloria, Virtual Learning: The State of the Nation and the State of the State, TEA, 2001

McClanahan, Gloria A., 2001. Virtual Learning: The State of the Nation and the State of the State (Second Edition) Prepared by: Educational Technology Division, The Texas Education Agency (TEA), Austin, Texas. January 2001. This is available on the TEA web site at www.tea.state.tx.us.)[40]

This is an unpublished annotated bibliography summarizing key characteristics of various virtual high school efforts across the nation and state levels. It also covers various issues regarding virtual learning, conference discussions, etc.

On the state of the state report, McClanahan summarizes the various entities offering distance education courses and corporate providers and, their various characteristics. The issues specifically highlighted for Texas are:

- Accountability
- Attendance and funding structure (assurance identity of student taking course)
- Instructional materials, content approval, funding (textbooks developed will eliminate need for hard copy?)
- Student evaluation procedures
- Teacher preparation, certification, evaluation procedures (compensation across districts, relationship to corporate providers, teacher evaluation)

A series of questions designed to answer some of the issues above were developed for virtual schools in Florida, Kentucky and Massachusetts and are also included in McClanahan's manuscript.

Virtual High Schools' Case Studies

http://vhs.ucsc.edu/vhs/casestudies.htm Accessed 10/11/02.

This is an archive for the Virtual High School conference. It is a good and succinct summary of approximately 20 high schools providing direct links to their pages last updated in 1999. It summarizes the content of their programs and the estimated costs.

State of the States

http://www.cait.org/shared_resource_docs/vhs_files/vhs_study.pdf.

This link is the site for the first edition of virtual high schools in the nation published in spring 2000. A second edition of Virtual High Schools is being compiled and is being up dated.[41]

"For the purposes of this list, a "virtual school" is "an educational organization offering courses designed for K-12 learners through distance learning methods that include Web-based delivery."

[39] All sites accessed in January and February 2002 or as noted.

[40] Most of the materials in this annotated bibliography are up to date. This Appendix, however, intends to complement and update some of the information that McClanahan has already compiled.

[41] See McClanahan (TEA, 2001) for complementary information of most of the following virtual high schools.

Alabama Online High School

http://altair.pacers.org/AOHS.htm

- Uses the Web as a means of instruction, with no extra software and only basic computer connections needed
- Teaches asynchronously, so students and teachers do not have to be online at the same time, allowing for flexibility in scheduling and more one-on-one interaction between students and teachers
- Concentrates on 4x4 courses including Spanish I & II and II courses are certified to follow the Alabama Course of Study. As the system expands rich electives will be added.
- Allows school systems to use their own teachers to teach online, helping systems maximize their existing instructional resources by having teachers be able to teach in multiple schools with little or no additional cost to the system
- Allows multiple systems to pool teaching resources in order to meet scheduling and budget requirements
- Has Alabama teachers developing all the courses offered; all courses comply with the AL course of study in their subject and are approved by the ALSDE
- Needs a local site coordinator to monitor students while taking online courses. Site coordinators are usually teacher aides but have also been librarians, teachers and other school personnel. School administrators are kept informed on student progress continuously.
- Uses Lotus Learning Space, a proven program that is easy for students and teachers to use and communicate with

Arkansas Virtual High School

http://arkansashigh.k12.ar.us/avhs_main.htm

The Arkansas Virtual High School is a pilot project funded through a grant provided by the Arkansas Department of Education. The purpose of the Arkansas Virtual High School is to provide an online alternative learning environment for the students of Arkansas' public schools who need assistance in completing coursework that is difficult to receive due to factors such as schedule conflicts, homebound status due to extenuating circumstances and other factors that might impede a student's progress through Grades 9-12. It is a coop system. All school affiliates in the AVHS cooperative are accredited and 11 agreed to give credit to AVHS courses as either core courses or electives. There is a common grading system for all courses in the Virtual High School. Grades range from A+ for excellent work to F for work that does not meet the minimum requirements of the course. Teachers report grades to the national offices, which pass these grades onto the student's administrative office. Students can be given credit by taking an end-of-course exam.

This page http://arkansashigh.k12.ar.us/AVHS_Policies.htm provides the agreement of responsibilities between parents and the district and also provides the equipment list needed to participate in AVHS. Below is the list of responsibilities for parents.

- Parents will monitor and be held accountable for the time students spend on work accessed from home and for the time spent on task during normal course times.
- Students taking a course through AVHS will abide by all rules and regulations governing the participation in and completion of AVHS courses.
- Students will be responsible for familiarizing themselves with ALL the rules involved in participation in an AVHS class. The rules can be found at the front door of all course offerings.
- Students of Arkansas High School will complete assignments and assessments in the time allotted by the AVHS instructor as indicated by the syllabus for the course and the time schedule posted.
- Students will participate in all discussions, online research and designated activities as outlined by the instructor for the credit they are attempting.
- Students will provide the AVHS instructor any extra information and/or work required to satisfy any project or course content requirements.

- Students will not use computers at times for AVHS work other than that designated by the Affiliate District and the timeline set forth for the class by the AVHS instructor.
- Students will be required to complete ALL scheduled lessons, material and online project activities during normal school hours or those deemed appropriate by the Affiliate District and in coordination and agreement with the AVHS instructor.
- Students may be permitted to do some AVHS research during evening and nonincluded time slots if required to fulfill a commitment to complete an AVHS class, but normal assignments, tests and other coordinated collaboration and activities will be done during normal contact hours of the normal school day.

Florida Virtual School

http://www.flvs.net/learn_more/facts.htm (formerly Florida Online High School)

FVHS also consults with others in developing online courses and other policy processes. "Mission Statement: The mission of the Florida Virtual School is to provide students with high-quality technology based educational opportunities to gain the knowledge and skills necessary to succeed in the 21st century.

Students served: Grades 9-12; Student enrollment: 5900 enrolled for the 2000-01 school year. Projected enrollment of 8,000 for the 2001-02 school year. Students receive their diplomas from their local high schools in their local school districts. There is no course fee for Florida students. Non-Florida students may take courses on a tuition basis.

Coverage area: The Florida Virtual School is affiliated with all 67 school districts throughout Florida and numerous charter and nonpublic schools. FLVS also serves students from other states and nations.

Course offerings: The Florida Virtual School is offering over 60 courses in the 2001-02 school year. These offerings include honors courses as well as ten AP courses.

Faculty: The Florida Virtual School instructional staff consists of more than 50 teachers who live throughout the state. All FLVS teachers possess a valid Florida teaching certificate and are certified in the subject they teach.

Delivery of instruction: All FLVS courses are delivered over the Internet. Students are provided a variety of Web-based, technology-based and even traditional resources to help them succeed in their course. Teachers communicate with students by e-mail, telephone and through the use of online chats within the courses.

History: The Florida Virtual School went online in August 1997 with Orange and Alachua counties as partnering districts.

Excellence in Distance Learning Awards:

- 1999 SEIR-TEC
- 1999 United States Distance Learning Association
- 2000 Canadian Association Distance Education
- 2001 NetDay Hero

Business partners: Business partners such as IBM, JonesKnowledge.com, Inc., World Book Encyclopedia, Workgroup Connections, Southwestern Educational Publishing, National Endowment for Financial Education, Junior Achievement, Math Resources Inc., Beyond Books and Get a Clue have provided important development resources."

Hawaii E-School

(see Hawaii's e-Charter) http://www.eschool.k12.hi.us/

The e-school branch or section operations are overviewed by Advanced Technology Research (ATR). ATR researches and disseminates information on new and emerging technologies that support the instructional and administrative operations of the public school system. The section provides technical consultation in the implementation of new technologies. ATR also coordinates emerging technologies and services to schools and offices: provides technical consultation, promotes research, promotes development of electronic resources, disseminates information and coordinates strategic plans with appropriate program managers. http://atr. k12.hi.us/

The Hawaii connection: an educational technology plan. Goals 2000. State of Hawaii, Department of Education, developed in collaboration with Technology Taskforce of the State of Hawaii. July 1994-95. http://www.k12.hi.us/~challeng/Goals_2000/

The plan provides for a set of planning goals and related strategies established for implementing the vision. The Hawaii EducationalTechnology Plan supports seven broad technology/education goals with a set of strategies for implementing each goal. These are summarized as follows:

Goal 1: Promote interagency coordination of technology programs and resources
Goal 2: Utilize technology to support national and state education standards
Goal 3: Provide support resources needed for effective technology integration
Goal 4: Expand access to and use of the information infrastructure
Goal 5: Ensure that the technology and resources are implemented as planned
Goal 6: Provide ongoing evaluation that guides future changes in the plan
Goal 7: Identify funding strategies and resources to support the plan

These seven goals are supported by 31 specific implementation strategies, 56 benchmarks, with related activities. These are all available at the web page above.

http://www.k12.hi.us/~challeng/Goals_2000/Appen_E.html Appendix J: ***Student outcomes for the foundation program:*** "All instructional areas are expected to contribute to some degree toward the attainment of all Foundation Program Objectives (FPOs). These objectives provide direction toward the holistic development of students.

- Develop basic skills for learning and effective communication with others
- Develop a positive concept of self
- Develop decision-making and problem-solving skills
- Develop independence in and a love for lifelong learning
- Develop physical and emotional health
- Develop knowledge of and pursue options for work and career development
- Develop responsibility to self as well as to others
- Develop creative potential and aesthetic sensitivity
- Develop leadership and cooperative skills
- Develop global awareness, knowledge and understanding
- Develop a concern for preserving and restoring our environment"

Illinois Virtual High School

http://ivhs.org/

Excerpts from the IVHS information packet (October 2001) http://www.ivhs.k12.il.us/pdfs/IVHS_Info_pack.doc

"The Illinois Virtual High School was planned as an educational service managed by the Illinois State Board of Education to expand student access to challenging high school curricula aligned to the Illinois Learning Standards. Through the IVHS, Illinois school districts, nonpublics and parents of home schooled students can provide students with access to a wider range of course offerings, with the opportunity to develop their capacities as independent learners and with increased time and opportunity to achieve because learning online is neither time nor place dependent.

Faculty-According to the policy framework adopted by ISBE in August 2000, all IVHS teachers are well qualified in the subject or area that they are teaching and have knowledge and skills specific to teaching online or through other technologies. Faculty may include Illinois teachers certified at the secondary level by ISBE, community college and higher education instructors and qualified instructors from IVHS partners. IVHS teachers who are full-time employees of consortium member schools or teachers under contract to the IVHS receive special training and education to prepare them for teaching online. They are actively supported throughout the length of the course to ensure that they are successful.

Enrollment-So that appropriate curriculum counseling can take place, all students enroll in the Illinois Virtual High School through their local public school district. Interested students should complete a Request to Register found at www.ivhs.org, which will automatically be submitted to the Illinois Virtual High School point of contact at the high school. If the student's high school has not submitted an IVHS School Contact Form (at www.ivhs.k12.il.us) the registration will not be able to be completed. The student may contact their high school guidance counselor to encourage them to become a participating school. Upon submittal of a Request to Register, the school will review the request and may approve course enrollment right away; refer the request for academic counseling; or deny the request with explanation. The student is not enrolled in the course until the local public high school approves the registration request.

The Illinois Virtual High School imposes no limit on the number of IVHS courses a student may be enrolled in simultaneously. This matter is determined by local board and school policy and will vary from district to district.

Credit-Credit is granted and posted by the student's high school. The Illinois Virtual High School does not grant credit, or award diplomas.
Certain IVHS courses may be taken for AP credit and will be designated accordingly in the Course Catalog.
Dual-credit may also be an option for some students. Students interested in pursuing dual-credit are advised to consult with their local high school and the IVHS staff.

Costs (and school funding features) -A combination of federal and state funding, per-course enrollment fees and a low-cost barter model will be used to meet the costs associated with the development and delivery of the Illinois Virtual High School.
A course fee of $300 per student, per semester course has been established for the IVHS that will offer prepackaged proprietary courses and content. As Illinois develops its own courses and content, the fee structure will be reevaluated. Local policy will govern the payment of fees for students enrolling through the schools.

For instance, the school may decide to pay this fee for students who are enrolled full-time in the local public high school when the credit earned from the course will be counted towards high school graduation, or if the course is not available at the high school, or if the student cannot be scheduled into the course at the school. An alternative is that a student who meets the qualifications set forth by the school board to take a class not offered at the local school may request that the school district pay the fee for an IVHS course. Similarly, the district may ask the student to pay the fee if the course is beyond the required instructional time or if the student elects to take the IVHS course in lieu of a course already available at the high school to gain credits towards graduation. Determination of fee payment for IVHS courses is a matter of local decision.

Students who are enrolled in the local public high school on a part-time basis for the purpose of accessing IVHS courses are generally expected to pay the course fee.

All course fees are paid from the district directly to the Illinois Virtual High School. The IVHS does not collect fees directly from students or other entities. The Illinois Virtual High School will serve as a course broker and pay all vendors for approved enrollments. A Student may drop/withdraw from an IVHS course within 10 days of receipt of a confirmed acceptance into an IVHS course without the district being assessed a $300 course fee, however a registration service fee of $30 will be assessed after beginning a course and dropping prior to tuition/fee assessment.

Costs (The barter model) -As the IVHS progresses, participation in the barter model will be an option for some districts. The IVHS barter model is based on the proposition that each participating school enrolls students in IVHS owned courses in proportion to the amount the school contributes in the form of teacher time. This model inherently supports growth and robust curriculum and instruction. Schools participating in the barter model receive "free" course enrollments for their students in exchange for teaching an equivalent number of students from other IVHS consortium members. There may be a charge to join the IVHS consortium to cover IVHS costs beyond those associated with direct instruction. Schools may participate as IVHS Barter Members under the following criteria:

- Possess Illinois State Board of Education recognition to operate as a school serving any combination of Grades 6-12
- Contribute the minimum required teacher time (20% FTE)
- Commit to teach up to 25 students enrolled in IVHS for each teacher-section contributed
- Possess Internet connectivity and computers to support the participating teachers and students (See Tech Specs)
- Provide an on-site coordinator. The coordinator is responsible for on-site operations and is the administrative point of contact between the IVHS and other Barter members
- Commit to the project. The administration and teachers must fully support the IVHS goals, objectives and plan

Academic Integrity-As a condition of enrollment, all IVHS students must accept the terms of the Illinois Virtual High School Ethics and Acceptable Use agreement. In addition, students will have signed the Acceptable Use Policy Agreement adopted by their local public school. All IVHS students are required to take their final course exam with a certified proctor. IVHS teachers have the ability to require that students perform other tasks or undergo additional assessments in similar situations. If a high school wishes to require other graded assessments or coursework in a proctored situation for any student or group of students, they may make those arrangements with the IVHS teacher. In addition, IVHS teachers will be trained to be alert to clues that might indicate problems. If the IVHS teacher suspects that there is a problem, the local high school will be informed."

Kentucky Virtual High School

http://www.kvhs.org/

The Kentucky Virtual High School is a statewide educational service delivering high school courses and online learning opportunity to Kentuckians. KVHS courses are delivered to public high schools through the Kentucky Education Technology System.

According to the Academic information page of KVHS (http://www.kvhs.org/index.real?action= Academic:) "The Kentucky Virtual High School is an educational service managed by the Kentucky Department of Education to expand student access to challenging high school curriculum. Through the KVHS, Kentucky schools can provide students with access to a wider range of coursework, with more flexibility in scheduling, with the opportunity to develop their capacities as independent learners and with increased time and opportunity to achieve learning goals because learning online is neither time nor place dependent. Thanks to recent action by the Kentucky Board of Education, students registered in a KVHS course may be able to earn credit and when taking courses outside the normal school day and from a location other than the school. KVHS courses are open twenty-four hours a day, seven days a week. Students enter KVHS courses only after approval is secured from their local public high school. No student may enter or drop a KVHS course without approval of their local public high school.

Enrollment-So that appropriate curriculum counseling can take place, all students enroll in the Kentucky Virtual High School through their local public school district. Interested students complete a Request to Register, which is automatically submitted to the Kentucky Virtual High School point of contact at the high school. The school reviews the Request to Register and may: approve course enrollment right away; refer the request for academic counseling; or deny the request with explanation. The student is not enrolled in the course until the local public high school approves the registration request.

Enrollment for fall courses is open to all Kentucky students seeking high school coursework. This includes students in nonpublic schools, home schooled students and adults seeking completion of a high school diploma. Regardless of their status, all KVHS students must register through a Kentucky public high school. The local public high school may simply act as registrar, or may offer part-time enrollment.

Course Fees

- $275 per half-credit course taken in one semester
- $500 per one-credit course taken in one semester
- $275 one-semester AP courses
- $500 two semester AP courses

Local policy will govern the payment of fees. *Generally, the school district will pay this fee for students who are enrolled full-time in the local public high school when the credit earned from the course will be counted towards high school graduation and the school cannot provide the needed course in the traditional manner.* The Kentucky School Boards Association model policy does recommend that the tuition fee for a course be borne by the local public school system for students enrolled full-time. (Reference KSBA Model Policy 08A.1131 on Alternative Credit Options or contact KSBA for more details.) Nonpublic school students will usually be expected to pay the course fee. Again, local policy decides the issue of fee payment and persons interested in KVHS courses should consult their local public high school about fee payment. Regardless of who is paying the fee, KVHS does not bill for the fee until about three weeks after the course has opened. There is opportunity each semester for a school to drop a student from a course with no fee imposed.

All course fees are paid from the district directly to the Kentucky Virtual High School. The KVHS does not collect fees directly from students or other entities.
Some KVHS courses require a textbook. Students or their school are responsible for acquiring and paying for their textbook. Information concerning textbooks is listed with the course description under the KVHS course catalog.

In addition, most of the AP classes require students to have access to a fax machine. KVHS does not cover the long distance charges to fax assignments to teachers.

Number of Courses-The Kentucky Virtual High School imposes no limit on the number of KVHS courses a student may be enrolled in simultaneously. This matter is determined by local board and school policy and will vary from district to district.

Credit-Credit is granted and posted by the student's high school. The Kentucky Virtual High School does not grant credit. Certain KVHS courses may be taken for AP credit and re designated accordingly in the Course Catalog.

Faculty-All KVHS faculty is certified at the secondary level by the Kentucky Office of Teacher Education and Certification in the content area of their course. KVHS teachers receive special training and education to prepare them for teaching online. They are supported throughout the course to ensure that they are successful. A brief summary of each teacher's experience and credentials are posted in the course catalog. KVHS faculty members are available for parent conferences via e-mail or telephone. Also, the KVHS faculty maintains contact with someone at the student's school (and /or a parent) to provide updates on progress and discuss appropriate support and encouragement if a student appears to be falling behind.

Class Size-KVHS class sizes do not exceed 25-30 students, depending upon the course. KVHS courses are based on a classroom model and differ in many ways from independent study courses. Each section of students has a single instructor for the duration of the course. In addition to teacher-to-student interaction, KVHS courses emphasize student-to-student interaction and group work. Students are able, however, to pace their learning and manage their progress through the course.

Alignment with Kentucky Curriculum standards -KVHS courses have been viewed by the Kentucky Department of Education, Division of Curriculum Development, for alignment with the Kentucky Core Content and Program of Studies. The review has been provided to the KentuckyVirtual High School instructor. Any gaps or weaknesses in the alignment are addressed by the instructor through course modification or supplementation. The KDE Division of Curriculum Development consults with KVHS on a continuing basis to ensure that KVHS courses, as delivered by our teachers, are appropriate and of high quality.

Academic Integrity-As a condition of enrollment, all KVHS students must accept the terms of the KentuckyVirtual High School Ethics and Acceptable Use agreement. In addition, students will have signed the Acceptable Use Policy Agreement adopted by their local public school.
All KVHS students are required to take their final course exam with a certified proctor. KVHS teachers have the ability to require that students perform other tasks or undergo additional assessments in similar situations. In addition, KVHS teachers will be trained to be alert to clues that might indicate problems. If the KVHS teachers suspect that there is a problem, the local high school's point of contact for the course will be informed.

Does the School Have to Assign Monitors to KVHS Students?
Schools do not need to assign monitors to students in KVHS courses. Students in KVHS courses may access their courses at regularly scheduled times during the day or after school hours. KVHS does ask the school for a point of contact, a person who may be consulted if the teacher has concerns about student progress or participation. Communication between the KVHS teacher and the local school is very important to student success."

Louisiana Virtual Classroom

http://www.lcet.doe.state.la.us/distance

The LVHS is a collaboration betweenThe Louisiana Department of Education http://www.doe. state.la.us/DOE/asps/home.asp and The Louisiana School for Math Science and Arts http://www.lsmsa.edu/ and is hosted by Apex Learning http://apexlearning. com/.

"The LVHS is a Department of Education initiative that provides Louisiana high school students with a gateway to Web-based learning opportunities.The LVHS is a part of the BESE 8g Louisiana Statewide Distributive Learning Network (SDLN) http://www.doe.state.la.us/DOE/asps/home.asp?l=SDLN which uses Web-based, satellite, telelearning and compressed video technologies to provide high-quality educational resources to students and teachers. First piloted in the school year 2000-01 as the LouisianaVirtual Classroom, this initiative utilizes the Web, e-mail and other online and offline resources to provide high school credit and AP courses to students across the state.

At present the program is open to all students in public and state approved private schools.There is no charge associated with the high school courses. A per student fee is applicable to the AP courses.Through the AP Incentive program http://www.doe.state.la.us/DOE/asps/home.asp?l=APIP funding for low income students is available.

Schools participating in the program must provide students with adequate computer and Internet access and an e-mail address. Schools must also nominate an on-site facilitator to serve as the contact between the LVHS and its students. Participating schools must assure nomination of a committed school facilitator who will act as a liaison, monitor and enroll students, handle grades and other administrative issues, as well as be willing to participate in LVC facilitator professional development.There are no fees for students associated with the program.The school must provide an on-site facilitator, hardware and software, computer access and an e-mail account per student."

Michigan Virtual High School

http://www.mivhs.org/ MVHS doesn't independently grant diplomas or course credit but works in cooperation with individual school districts. In the year 2000, Michigan started offering for-credit classes to high school students via the Internet. Michigan sees MVHS as the vehicle to provide equal access to AP courses, regardless of a school's size or geographic location.

"The MichiganVirtual High School (MVHS) is an online resource that enables Michigan high schools to provide courses that students wouldn't otherwise have access to—all taught by certified Michigan teachers. It was funded by the Michigan Legislature in July 2000 for a three-year period to be operated by the MichiganVirtual University (MVU), a private, not-for-profit Michigan corporation.

Through MVHS, Michigan high school students can take courses and learn any place there is a computer and an Internet connection. We're here to help educators prepare our children for a lifetime of using increasingly integrated technology in their work and their lives including:

- Gifted and talented students
- Special needs students
- Students who need to "make-up" credit
- Public and nonpublic school students
- Home schoolers

MVHS has the capacity to help schools stretch school budgets, provide staff development opportunities and improve student performance.

New Mexico Virtual School

http://www.nmvs.org/

This page is still under construction as of 10/11/2002. (See McClanahan [2001] for more information.)

North Dakota Division of Independent Study

http://www.dis.dpi.state.nd.us/ISC/classes/OLCourses.html

"The division of independent study provides a core curriculum on the World Wide Web which encompasses all the courses required for high school graduation.

Elementary School-The Division of Independent Study is moving toward a complete K-12 curriculum. Fifth grade courses have been developed. These are designed to be full year courses and follow national as well as North Dakota's content standards.

Middle School-Requirements for Middle School courses vary from state to state. The courses provided by the Division of Independent Study are designed to meet the requirements for students in the sixth, seventh and eighth grades. There will be instances, however, when these courses will apply to students in other grade levels and situations.

High School-Students may earn an accredited high school diploma through the Division of Independent Study. The core curriculum is available in a paper or Internet-based medium. Credits earned by completing courses from the Division of Independent Study may be transferred to a local school district.

Enrollment Cost Tuition-covering teaching services, is $66.00 per half-credit course for North Dakota residents and $78.00 for nonresidents. The costs of textbooks and course materials are stated in the course descriptions. There is a $21.00 per half-credit course enrollment. The $21.00 handling fee covers invoicing, packing and shipping of all initial orders as well as returning evaluated lessons work to any United States address. In addition, it covers the cost of providing electronic delivery services to students enrolled in online courses.

Supervisors-The North Dakota Division of Independent Study (NDIS) requires unit tests and final examinations to be administered by an approved supervisor. Supervisors must be approved by the administration of the local school or by NDIS. Supervisors of students graduating from the local school need only the approval of the local school official. Supervisors of students graduating from NDIS need only the approval of the Division administration. The preferred choice for an approved supervisor is an elementary, secondary, or post-secondary educator. This includes teachers, counselors, administrators, librarians and professors. In addition, members of the clergy, public librarians and military education personnel may serve as supervisors.

The primary responsibility of the supervisor is to administer examinations. In addition, supervisors advise and encourage students, mail lessons and tests to the Division and return evaluated work to the student for review."

Utah Electronic High School

http://www.ehs.uen.org/

This site is a registration site and provides little information on the management and administration of this high school. See "Utah Electronic High School" entry under virtual high schools that offer credit below.

Academic high school courses categories offered are: Healthy Lifestyles, Language Arts, Science, Social Studies. Once the student has successfully completed the course work, EHS will mail a certificate of completion to the student and to his local school.

See *Case Studies* from the Virtual High school conference for more information on Utah's EHS.

West Virginia Virtual School

http://access.k12.wv.us/vschool
http://virtualschool.k12.wv.us

"The West Virginia Virtual School was created by Senate Bill 584 and became effective on July 1, 2000. It was created within the West Virginia Department of Education to offer high-quality educational courses to students through Internet technology, regardless of school location or size. West Virginia Board of Education Policy 2450, Distance Learning and the West Virginia Virtual School, was revised in the fall of 2000 to reflect this legislation http://wvde.state.wv.us/ policies/p2450.html (see policy sub-section under annotated bibliography)

The West Virginia Virtual School offers required courses in English, mathematics, science and social studies. AP courses are also offered and are among the most requested services of the West Virginia Virtual School. Additionally, elective, enrichment and remediation classes are available, including several information technology courses. A variety of upper-level mathematics and foreign language courses are also available.

At the West Virginia Virtual School's web site http://virtualschool.k12.wv.us, students may access the course catalog for a description of approved courses, preregister to request courses and register online for courses when approved by their local school. Each school has a contact who facilitates enrollment.

The "Reinventing education" site http://reinvent.k12.wv.us/ reflects the work in partnership with IBM Corporation providing online instructional development and support of the West Virginia Reinventing Education Model. "The high-quality lessons posted to this web site have passed a stringent jurying process based on specific criteria for each curriculum area. Each lesson is aligned with specific West Virginia Instructional goals and objectives, process workplace skills and the appropriate national standards for each subject. In addition to the lessons database, tools are provided for communication and collaboration among the community of users."

Virtual High Schools That Offer Credit—2001

http://www.enc.org/focus/horizons/document.shtm?input=FOC-002319-index#credit

This is a supplement to Verona's (2001) article on Maryland Virtual High school. The following is excerpted from this page.

Choice 2000

www.choice2000.org

"One of the original charter schools in California, bills itself as "the first totally public online school in the United States." It is free to students living in Riverside, San Bernardino, San Diego, Imperial and Orange counties. California students living outside these counties are prohibited from attending, but other students worldwide pay tuition to attend. Students meet weekly in synchronous sessions. Advanced mathematics and science courses are not included among the offerings listed on the web site.

Cyberschool

(http://cyberschool.K12.or.us/) does not offer a full curriculum, but enables schools to provide options to motivated students. Recent offerings in science include general biology, DNA and genetics and marine ecosystems. In mathematics, CyberStat I and II are advertised as preparing students to take the AP statistics exam. The school's Math on the Web program includes a series of minicourses featuring topics such as formulas and spreadsheets, systems, random choices, matrices and exponential growth.

Utah Electronic High School

(http://ehs.uen.org/) offers a wide range of courses including many in math and science. Courses are available through broadcast television, two-way video, independent study, the Internet, satellite and videotape. Students enroll to make up lost credit or to take courses not offered at their school. Many courses are free to Utah students. Others pay $100 per semester.

Concord Consortium VHS

The Virtual High School (http://www.govhs.org/website.nsf) developed by Concord Consortium through funding from the U.S. Department of Education has enrolled more than 3,000 students from 250 schools in 150 online courses. Schools participate through a reciprocal arrangement in which one faculty member must teach an online course. When government funding ended in January 2002, VHS was to become a nonprofit organization. Schools will pay $6,000 a year to enroll 20 students in course offerings. Math courses range from AP calculus, to fractals, to the history of mathematics. Science courses include geology, genes and disease, environmental chemistry and integrated mechanical physics among many others."

Maryland Virtual High School

http://mvhs1.mbhs.edu/mvhs.html

MVHS virtual high school programs do not provide high school course credit to students through online interaction.

Verona, Mary Ellen, 2001. Learning Mathematics and Science in a Virtual High School Eisenhower National Clearinghouse Focus 8(4) http://www.enc.org/focus/horizons/document.shtm?input=FOC-002319-index describes the Maryland Virtual High School of Science and Mathematics (MVHS), which was created in 1994 by teachers who wanted to share the experience they had had in a special summer computational modeling program (SuperQuest). The goal was to enable other science teachers and their students to use computer modeling to solve real-world science problems. Such activities emulate the work of scientists and meet the recommendation of a National Science Foundation report.

Service Provider: APEX

http://apexlearning.com Accessed 10/02.
APEX offers an example of how a for-profit company can support school districts. This company markets online AP courses, targeting districts that want to offer AP but which do not have qualified teachers. Districts can, thus, use APEX offerings on-site (See McClanahan (2001) as well).

Appendix I

An Example of Infrastructure Evaluation Components for Distance Learning

Appendix I
An Example of Infrastructure Evaluation Components for Distance Learning

Adapted from Belanger and Jordan, 2000: p. 217 *http://emedia.netlibrary.com/reader/ reader.asp? product_id=42254 accessed 2/5/2002*

Example of Infrastructure Survey and Upgrade Requirements	
INTERNET REQUIREMENTS	**Instructor/learner upgrades required**
Internet connectivity? • Asynchronous capability • Synchronous capability	100% Internet connectivity for all employees. Large b and width pipes (OC-3 or greater). Fast Ether switch LANs w/10Mbs dedicated capacity to each workstation.
• How accessible is this connectivity?	Always available.
How will connectivity be achieved? • Modem / dial up • LAN • WAN	Department LAN in the office environment. DSL, ISDN and dialup modem connectivity at V.90 (56kbs or greater) for remote users.
• How fast is the speed of connectivity?	Minimum 56 Kb for dialup. 10Mbs dedicated for each work-station at work.
Is Internet connectivity provided through a shared facility?	Shared LAN but dedicated bandwidth for each workstation.
Do you have an Internet e-mail account?	All instructors and learners have corporate Internet e-mail account.
DESKTOP/LAN	**Instructor upgrades required**
Is your desktop connected to an LAN?	Yes, with remote dialup connectivity on a virtual private network.
Do you have access to a shared file server?	Yes, by department or work group.
Do you have a web browser loaded on your desktop?	All PCs have a standard browser loaded for use.
Are web plug-ins allowed on your workstation? • Java • Shockwave • Adobe Acrobat • Real Audio	Plug-ins are available for download from the corporate intranet site.
What office productivity software do you have access to? • Lotus Suite • Microsoft Office	Lotus Suite and Microsoft Office are both available and supported through corporate licenses.

DESKTOP/LAN	**Instructor/ upgrades required**
What graphics packages do you use?	All of the most commercially popular graphics packages are supported and licensed by the firm.
What type of desktop hardware do you have? • 486 (<150 Mhz) • Pentium I (150-300 Mhz) • Pentium II (300+ Mhz)	Standard desktop is the Pentium III, which has just been released.

What is the storage capacity of your desktop? • <5 Gb • 5 or more Gb	All desktops have at least 6 Gb of storage, with over 50% having at least 10 Gb. Corporate laptops have 2-6 Gb of storage but employees can order upgrades.
Is your desktop equipped with multimedia capability? • Sound card • Speakers • Color monitor that can display 16 bit (256) colors • Video card • Video camera • Microphone	Each corporate desktop is fully equipped for multimedia, including desktop VTC equipment. The company has just installed VTC to the desktop capability.
What desktop operating system(s) do you use? • Windows 3.1 or 95/98 • OS/2 • Macintosh • Linux • Unix	Over 50% use Windows 98; the remaining 50% use Windows 95 and expect to move to Windows 2000. Corporate web servers include NT and UNIX machines.
What network operation system do you use? • Novell • Windows NT • Other	Most shared applications and communication tools in the company are designed for a Windows platform, except for some Web-based applications that are on UNIX.
E-mail platform(s) • MS Mail • Lotus Notes • Microsoft Exchange • CcMail • Netscape Messenger	E-mail capability required to support DL includes sending and receiving attachments and multimedia files; ability to participate in listservs and newsgroups; ability to send/receive large files.

DESKTOP/LAN	**Instructor upgrades required**
Do you have an intranet (Web-based access to corporate LAN and applications) in your organization?	Although not required, organizations with an intranet can create a thriving learning environment that is easily accessible (at high speed) to all employees when they are at work. The intranet can also be accessed by remote dial-up if employees have an account
What is aggregate throughput of data on LAN?	Fast Ether switch of 400+Mbs with dedicated 10Mbsto each desktop.
What is protocol of LAN? • TCP/IP • Novell Netware • Microsoft NT domain	TCP/IP supported on Novell Netware.
COLLABORATION	**Instructor upgrades required**
Do you have access to collaboration user software? • Shared whiteboard • NetMeeting • Listservs • Web forum • [others]	All Web-based collaborative applications are supported (Web forums-both threaded and synchronous chats), VTC over IP using NetMeeting, shared whiteboards and internal listservs and group decision support software.

Do you have a server dedicated to host collaboration software?	There are four dedicated servers to host collaboration software.
USER SUPPORT	
Are you supported by a Help Desk?	A 24x7 virtual Help Desk (phone, e-mail, fax and Web-based applications) is available to all employees around the world.
How quick is the response time when you call for help? • <one hour • 1-3 hours • 4-8 hours • 1-2 days • >2 days	A "triage" system for help categories the type of trouble call, with calls fielded to the technical group that is most likely to provide a quick and effective solution. Help Desk support applications keep track of all calls and statistical analyses are available to track tickets. An internal knowledge management system has been added to capture "lessons learned" and provide remedial training or updated training for technical problems/solutions.

USER SUPPORT	
Is the Help Desk staffed around the clock?	7x24 coverage, worldwide, in English, Spanish and French.
VIDEO TELECONFERENCING	
Type of TC system	The corporation has both large scale and desktop videoconferencing systems. Large scale systems are installed in each main office. The large scale systems are installed in conference rooms with a maximum of 10 participants. The desktop facilities are provided using a videoconferencing software package developed internally that can be easily installed on each employee's workstation.
How many hours per month are allocated for TC training?	In large scale facilities, no time is currently allocated for training.
Studio capacity (student seats)	Ten
VIDEO/INTERACTIVE TV	
Do you have access to a broadcast facility?	No
How many broadcast studios do you have access to?	N/A
Do you have access to downlink facilities?	Yes, but located within the teleconferencing rooms described above.
How many classrooms have VTT reception capability?	N/A
How many hours per month are available for VTT or video programming?	N/A
What types of support personnel are available for the VTT uplink and downlink facilities?	N/A
Does your uplink site have the ability to connect with desktops?	N/A
Is there a video library in your organization?	Yes. Several videotapes were produced in-house and several others were acquired on the market. Videotapes, however, tend to be out-dated.

COMPUTER LEARNING CENTER/LAB	
Do you have access to a computer learning center/lab?	LCs are fully equipped with multimedia workstations for CBT learning; labs are equipped with synchronous communication tools for TC as well.
How many computers are installed in the lab?	Each lab has 20-35 workstations. Each regional office has at least one lab.
What is the student to computer ratio for lab use: • 1-2 students per computer • 2-5 students per computer • 6-10 students per computer • 11-20 students per computer • 21+ students per computer	The ratio of students to computer lab is somewhat high (50 students per computer), but most students elect to do their training at their own workstations or at home. Only certain specialized courses require students' presence in the computer lab.

Appendix J

Internet-Based Information Technology Infrastructure

Appendix J
Internet-Based Information Technology Infrastructure (Perez, 2001)

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Interview, Austin, Texas, 2/17/2002

This section intends to clarify at a basic level the various components of information technology infrastructure. This model is offered in order to support cost models for Internet- based[42] resource development because one of the issues in the literature is the lack of "standardization" in accountability categories. This is the infrastructural model used by Dr. Perez to clarify to his clientele the infrastructure costs involved in videoconferencing implementation and other e-learning strategies offered by Intellinex.

To understand and the term information technology infrastructure, Dr. Perez explained the Seven Layer Network Infrastructure Model. The model is represented in a bottom-up fashion showing the steps needed in development of the various layers necessary for local network infrastructure.

The model below refers to LAN connectivity.[43] Layers 1 to 4 are the essential elements of a LAN. That is,

connection (port) → **router** → **LAN** → **server** (or ISP).

7-Layer Network Infrastructure Model
(Bottom-up)

Layer	Name	Description
7	Application	What is the LAN going to be used for? In this case, distance learning software applications.
6	Presentation	How is the information (data) going to be presented and what are the needs associated with this (video, audio, graphic, text, interactive, etc.)?
5	Services	What type of connection media is the LAN going to be used through (phone, Digital Signal lines, Internet)?
4	Transport	The interface itself, or how the "payload" (the data) is carried.[44]
3	Network	These are the protocols of communication between computers in LAN.
2	Data	Bits of information.
1	Physical	Cables or "wireless" physical hardware

"Everybody thinks of the Internet as a big cloud in the sky."

[42] The Internet is not a phone dependent infrastructure. In earlier days, modems were used and these were analog based (phone). The ISP or Internet Service Provider is in essence an integrated service digital network or ISDN and is a pool of routers (most likely provided by phone companies like ATT or Bell South). These connections are designed for users to stay online for no longer than 3 minutes (the length of an average telephone conversation, whereas Internet connection needs are in hours).

[43] Though an important aspect, in the above context, personal computers are not considered part of a LAN infrastructure.

[44] The payload was explained with the analogy of a train and its carts. Each "cart" is an information carrier and it is sent in bits.

In this model, Internet-based communication takes place between a LAN (levels 1-7) to another LAN via the Internet. Dr. Perez emphasized that this is commonly not understood, that the interface between networks goes through all seven levels of a LAN.[45]

Layers 1 to 4 are important in determining costs at the most basic level. According to Dr. Perez, local infrastructures (as defined in the model above) are "extremely" affordable today. A DSL[46] (digital signal) LAN connection costs about $200.00 per month, a router costs anywhere between $100.00 and $500.00 total and the Cat-5 (Internet cabling) costs $100.00 per port (for remote or isolated areas, the cabling might be double this cost due to additional length). *Once layers 1-4 are set up, all other costs are incremental.*[47]

Variability in Layers 5-7 is important in determining costs for Internet-based education systems and resource development strategies. If a school is LAN-ready, then e-learning investment costs will vary as design strategies accommodate each system's needs (e.g., whether the client wants to have capacity for synchronous webcasting or video). These are design decisions and cost variations to be decided in layers 5-7. It is in these layers that information technology staff and tech-support and instruction decisions are to be made. Each of these systems will have its own needs and its costs must be determined on a per/LAN basis.[48]

Speed as Driver: The Business of e-learning in the Future

The most important driver of this industry is speed. E-learning from business to business needs to be accomplished quickly. As an example, Dr. Perez said that Ernst & Young has products sold by 10,000 people around the world who need to be educated quickly. Sometimes a product can be obsolete within three months. E-learning has provided method for this information to be transferred at the pace required in the business world.

In terms of coming technologies, there are now available different forms of display or 3-D projection where the instructor appears to be in the room, creating nearly real-time, face-to-face interactions.

The long-term vision is to develop wireless networks that will have larger capacity and will continue to support expansion worldwide. This is particularly important for remote locations. Streaming and video webcasting are being refined and costs are decreasing. This could reduce the cost of educating people via e-learning not only in Texas but also worldwide.

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[45] He explained that data are transmitted from level 7 to 1 in the originator system and, as it reaches the receiver network, the data move from level 1 to 7.

[46] Not everyone has equal access to a DSL line. Dr. Perez believes that though the initial cost might be higher, that wireless (satellite) is probably a better investment in the long-term.

[47] Costs will also vary in relationship to isolation ("remoteness") or economies of scale.

[48] Appendix G offers an example of an evaluation plan for e-learning systems. It has been included as an example of how to assess base-line cost-categories needed in an accounting system for network layer (5-7) design.

Appendix K

Selected Annotated Bibliography

Appendix K
Selected Annotated Bibliography[49]

Status research

Clark, Tom, 2000

Clark, Tom, 2000. Virtual high schools: state of the states. A study of virtual high school planning and operation in the United States Transformational Associates Report. Springfield, IL: Western Illinois University Center for the Application of Information Technologies.

This study, commissioned by Western Illinois University (WIU), profiles the approaches of five states (Florida, Michigan, Kentucky, New Mexico and Utah) in developing a statewide virtual high school (SVHS). The study looks at various SVHS and for-profit corporate initiatives. It provides an analysis of the several key forces driving state interests in this school format: state and federal initiatives, curriculum and equity concerns and unique state attributes. Key characteristics of various SVHSs are summarized, e.g., development and delivery platforms, enrollment and programs. Recommendations are also summarized. Appended is a virtual high school resource guide as well.

An SVHS is defined as a state-approved or regionally-accredited school that offers secondary credit courses though distance learning methods that include Internet-based delivery. This is the next wave of technology-based K-12 education along with proven delivery systems such as videoconferencing or television media.

Education Week (2002) e-Defining Education

Education Week online (s.a.) (2002) Technology Counts *E-Defining Education: A Survey of State Technology Coordinators,* http://www.edweek.org/sreports/tc02/ article. cfm?slug=35execsum.h21. May 9, 2002. Vol. 21, (35), pp. 8-10. Accessed 8/13/2002. Links to statewide initiatives map http://www.edweek.org/sreports/tc02/chart.cfm? slug=35execsum-c1.h21. Link to *Tracking Tech Trends* State data Tables http://www.edweek.org/ sreports/tc02/article.cfm?slug=35tracking.h21. Link to *State Profiles* http://www.edweek.org/ sreports/tc02/35profiles_map.htm.

This is a very useful resource for recently updated information. It is an interactive set of articles, charts, profiles and tables useful for finding details on statewide e-learning implementation efforts. Information is based on a recent survey of state technology coordinators.

Reston, Maeve, 2001.

Reston, Maeve, 2001. *A public school in privacy of home. Forget the bus: Some Central Texas students to take classes via Internet.* Austin American Statesman, August 22, 2001, p. B-3.

This article announces that Texas Virtual Charter School will be one of 11 schools and school districts to receive state money this fall to educate students online. It will be managed by a for-profit called K12 managed by US ex-secretary of education, William Bennett. Other charter school applicants include University of Texas. K12 says they will hire certified Texas teachers to teach curriculum and parents will be responsible for overseeing students.

Summary statistics are presented in this article: Enrollment— 500; Grades— Kindergarten through second grade; Program—Web-based, curriculum provided by K12, a private, Virginia company headed by William Bennett; Tuition: none; Annual per pupil expenditure: $4,500; School start date: September 7, 2001.

[49] All sites accessed in January and February 2002 or as noted.

Sack, Joetta L., 2001.

Sack, Joetta L., 2001. *Ed. Department Finds Charters Spur Existing Schools To Improve.* Education Week, June 20. http://www.edweek.org/ew/ewstory.cfm?slug=41charter.h20

New Department of Education research concludes that charter schools are helping other public schools and districts improve through competition. Districts are improving educational programs in regular public schools as a result of competition from charters and charter schools are feeling pressure to hold their students and staffs accountable to high standards, according to two separate reports released jointly.The reports, part of a four-year evaluation of the fast-growing movement to create the publicly financed but largely independent schools, give a boost to the Bush administration's position on public school choice.The Education Department estimates there are now about 2,100 charter schools in 36 states, the District of Columbia and Puerto Rico.

Peake Group, 2002

Peake Group. 2002. *Virtual Schools Across America: Trends in K-12 Online Education 2002.* http://www.peakgroup.net.

The Peake Group developed five criteria for classifying a school or program as a virtual school.

- Online delivery, via the Internet, is the primary delivery method
- There is a focus on K-12 education
- The audience reached by the school or program is larger and broader than that of the traditional day school
- The school is either accredited or closely affiliated with an accredited organization
- Students can receive credit from the virtual school or their local school

NSBA, 2002

NSBA. 2002. *Are We There Yet?* http://www.nsbf.org/thereyet/index.htm

The number of virtual schools and students enrolled in them are increasing. Technology decision-makers in more than 800 district predicted increasing enrollment in instruction via the Internet. However, survey participants identified a number of challenges such as finding ways to verify that students have completed the work themselves, handling transfer students and credits earned online, ensuring that courses fulfill graduation requirements and appropriate state and local funding mechanisms. Other issues identified in the report include:

- Concern for limited opportunities to develop social skills and social responsibility
- Absence of good mechanisms to ensure quality control
- High dropout rates
- Equity issues related to the belief that benefits of virtual schools will accrue to wealthier students
- Cyber charter schools that siphon off resources from school districts
- Concerns that appropriate preservice and inservice preparation for online teaching may be missing
- Concern about the intense time commitment often required of online instructors
- Balancing individual pace in online learning with seat-time requirements for school attendance
- Teacher employment, contract and certification requirements

Global to local e-learning research

Tiffin and Rajasingham, 1995.

Tiffin, John and Rajasingham, Lalita, 1995. In search of the virtual class: Education in an information society. London: Routledge.

This book is a vision piece. It looks at the new structure in information technology, the cultural shifts of the educational society and argues for the necessary shifts in the educational model. Central question posed is why this powerful

communication system (television assisted programming, computer assisted instruction, correspondence education) had not been able to replace the classroom system, which has been around for a thousand years. The authors argue that a genuine revolution is in the making because all these cluster of technologies combined with virtual reality, nanotechnology, fiber optics, will cause a communication upheaval rivaling the industrial revolution of the nineteenth century. The alternative is the virtual class and it is nothing like what is currently understood as telelearning.

Researchers for this book have a transnational background. Though research was based in New Zeal and was to be implemented in the University of Wellington by 2001, this study was informed by the combined experience of the authors in Europe, Africa, Latin America, Pakistan, Fiji, Malaysia, Philippines and Sri Lanka. This book looks at the complexities of communication and education and the cultural adjustments and transformations needed for the next pedagogical paradigm, the virtual class.

This study envisions what education and training could become as the information technology continues to develop. The central argument is that to prepare people for production in an information society, they need to be taught with the technology of an "information society." This book takes a new look at pedagogy from the perspective of communication; it argues that learning takes place through communication systems that bring together learning, teaching, knowledge and problem solving and centers on the learner. They also argue that in the past, telelearning reached the learner at a dyadic level (teacher-student) which is a different level than the traditional classroom setting. Yet, the culture of computer usage is today widespread and the teleconferencing capacity does bring forth the possibility of a virtual classroom as a tangible reality. The levels of interaction in the virtual classroom are geometrically increased. "At a mass level, the learners could today, in a telelearning system find themselves as part of a consortium of schools and universities (p. 185)." Availability of resources in the Internet has also increased the possibilities for learning at multiple levels beyond the dyadic approach of past telelearning designs.

Brande, Lieve Van de, 1993.

Brande, Lieve Van de, 1993. Flexible and Distance Learning. Dissemination of Scientific and Technical Knowledge of the Commission of the European Communities, Directorate General XIII, Information Technologies and Industries and Telecommunications. West Sussex, England: John Wiley and Sons.

This is an overview of the state of distance education in the European Union as of 1993. It discusses what are distance and flexible learning technologies (at the time, this included independent study, correspondence textbook-based, interactive computer technologies, telelearning and the like). The European Commission intent on looking at the status of flexible distance learning programs is clearly articulated to technology-based production and market trends. It includes various reviews of the Organization for Economic Cooperation and Development (OECD) and also descriptions of the British Open University System, the Netherlands, Germany, France, Portugal, Spain, Denmark, Belgium, Sweden, Norway and present initiatives in Greece, Italy, Luxembourg and Ireland. In conclusion, three evolutionary steps are derived. The first stage is characterized by the use of one medium (printed word, radio and television) sometimes complemented by support services to students; the second stage started with the founding of the British Open University with a delivery model using a wider range of interrelated media. This study reports that the British concept has been widely followed with minor local adaptations—a combination of centrally produced written materials divided into units, localized tutoring and counseling and radio and television broadcasts. Computer-based learning materials were added to this model then. Most of the European distance education institutions use this delivery model, mixing advanced technologies with their traditional teaching methods (correspondence, seminars, etc.) especially where the specific subject matter is propitious for the use of media. Media, audio, videocassettes, diskettes, compact disks, are used as the carrier of information.

Interaction may happen through telephone, telefax, interactive videotex, teletex/telex, datex as well as radio/television networks and videoconferencing. Information channels differ greatly in these countries. The enormous breadth of information available through mass media is what seems to be the most important advantage offered by flexible education. Less frequently used on experimental basis are systems allowing for individual feedback channels permitting delayed or simultaneous communication (pp. 138-139). The report states that European distance education is now at the beginning of a new and third stage where students are able to make an individual choice of the mix media and teaching aids that best

suits their learning style. Distance learning is then moving towards true flexible learning in this sense. Issues raised in all different program locations studied were: institutional and user acceptance, cost effectiveness, increasing quality of training process, growing interweaving of didactics and technology and quality of the interactivity and support mechanisms (telematics). Under this last issue, the recommendations to continue to experiment with "virtual classrooms" though electronic media as a means of overcoming communication problems and of making a better provision for interactive mode of teaching. Lastly, it seeks to coordinate trans-border delivery systems, enhance cooperation of distance teaching institutions and clearing up cultural difference and legal barriers to do so.

This report documents the profound impact that electronic technology is having on the educational model of the traditional classroom setting. It documents that more and more multi-aged, multi-leveled, multi-disciplinary interaction is taking place in this flexible setting and that students and teachers are rapidly adapting to this. Most of this is taking place at the higher education level, so it is hard to tell what kind of impact it will have in the preuniversity and vocational system.

Impacts on the workplace have been: an increasing willingness of employees to allocate funds for work-site base training; educational institutes are expressing interest in being originating as well as receiving sites; the classroom is increasingly being extended to the community and workplace; there is growing recognition of the need to continually train and upgrade technological and information training needs; and there is an identified a need to provide differential responses to basic education, training, retraining, skill upgrading and professional development (p. 201).

As Europe faces a major challenge to retrofit its industry and to remain competitive, this report recognizes that key is the investment in flexible and distance learning. This report identifies creating a most appropriate human resource strategy to respond to these needs and this lies in the increasing need to educate people at work as a main difficulty; that is, to create a system for flexible training at work and to interconnect these educational systems despite geographical location within the European Union. This requires the investment and creation of the infrastructure for distance learning to embrace the pedagogic possibilities expanding and consolidating the new EU identity. The goal (then in 1993) aimed at coordinating and establishing a Europe-wide infrastructure for flexible education, but a key capacity issue identified was the R & D investment to support the need to advance human labor skills with cost effective and efficient training to meet the social and economic needs of the European Community. An eventual goal was the transfer of such technologies to the LDCs of Eastern Europe.

Angrist and Lavy, 2001

Angrist, Joshua and Lavy, Victor, 2001. New evidence on classroom computers and pupil learning. Iza discussion paper No. 362, September. Bonn, Germany: Institute of Study and Labor <http://www.iza.org./publications/dps/dp362.pdf>

This digest presents the results of the impact of an Israeli initiative to install computers in many elementary schools. Results show that teacher use of computer aided instruction (CAI) increased in 4th grade but was minimal on the 8th. The study finds: 1.) CAI does not correlate with higher test scores; 2.) Only correlation between CAI and test scores shows a negative effect on math in the 8th grade; and 3.) Fourth graders awarded computers show lower math grades with insignificant effects on language scores.

Technical issues

Copyright Office, 1999

Copyright Office, 1999. Report on Copyright and Digital Distance Education. Accessed 12/10/2001. <http://www.loc.gov/copyright/disted/> and http://www.loc.gov/copyright/ docs/de_rprt.pdf

This is a report investigating the copyright needs for distance education using digital technologies. It describes the legal actions written in the Digital Millennium Copyright Act of 1998 (DMCA) where Congress charged the Copyright Office with the study of the issues. The report provides an overview of digital distance education (DDE) today and describes needs assessment findings for today and projects into the future. It also focuses on practices; describes technology related to

delivery and protection of DDE materials; analyzes the issues related to the application of current copyright law on DDE activities; discusses prior policy initiatives; and finally deals with recommendations to change the laws.

DDE in the US is a burgeoning field. DDE technologies have had a synergistic effect and have fostered rapid expansion in terms of the populations served and the institutions and partnerships that have emerged differing in nature and scale in an unprecedented way. The most fundamental definition of distance education is a form of education in which students are separated from their instructors in time and /or space. DDE is in some form or measure is already integrated into the educational spectrum, with its most extensive use being in higher education. "The capabilities of the new technologies have made possible a more interactive experience that more closely parallels face-to-face teaching, in effect creating a virtual classroom." In the past few years, shifts and adjustments have taken place in the courses themselves, making these media more convenient and more cost-accessible as well—this may include synchronous and asynchronous methods.

In terms of technologies involved in DDE, this report finds that "there is no 'typical' digital distance education course (p. iv)." Instructors may build courses from scratch and more often than not, customize commercial software. They may combine e-mail, threaded discussions, chat rooms, whiteboard programs, shared application, streamlined video or audio, video or audio files, course management infrastructure, links to web sites and interactive CD-ROMs or DVD-ROMs. The need to provide technological security for copyrighted works is clear. The report finds that usually educational institutions have ways of limiting access to students enrolled in the class through various methods (password protection, firewalls, screening for IP address or domain names, hardware connections, encryptions, or using CD-ROMs as delivery mechanisms). Once access is obtained, users can download the materials and, in some cases, make these materials available to others without authorized access. Copyright protection of existing materials may not be sufficient to prevent widespread distribution. Complicating matters, are materials that have subsequently been modified by students or instructors so that a "new" product or set of materials has been created. Subtle modification to existing products (creating a new product) is already an issue in patent lawsuits. The report finds that with increasing technological advances, developments in terms of protecting content are harder to predict (p. vi). The report predicts that prevention of "downstream use" will gain widespread market acceptance, but the study remains inconclusive as to the extent to which these can be made available in practical form for use in DDE.

Pletz, John, 2001

Pletz, John, 2001.
Fingerprint technology gets a real thumbs up. Biometric Access Corporation of Round Rock gains $12 million infusion of venture capital. Austin American Statesman, August 22, 2001, p. C-2.

Biometric Access Corporation (BAC) develops hardware and software to use fingerprint identification for financial transactions, employee attendance tracking and computer access. The article reports that this technology is already in use in several employee attendance applications to cut done on time-clock mistakes and fraud.

Trotter, Andrew, 2001

Trotter, Andrew, 2001. *Ohio Audit Reveals Difficulties Of Tracking Online Students.* Education Week. Dec. 5. Accessed 10/11/02. http://www.edweek.org/ew/newstory.cfm?slug=14cyber.h21

A recent state audit concludes that Ohio does not have a "handle" on evaluation, assessment and monitoring of its new cyber charter school eCOT (Electronic charter of tomorrow). The article states that eCOT received $1.7 million in state payments for students who may not have met enrollment requirements in September and October of 2000. The audit's findings highlight a problem facing the growing number of cyber charter schools around the country who need to provide evidence that students are engaged in learning even when the students aren't physically in a classroom. The school claims that the state defined the enrollment seven months later than the school opened. Another issue was that the students started working prior to receiving computers and prior to the school having installed modem connections.

In terms of attendance, the auditors suggested that the school count the log-ins of students to report attendance. The article quotes the superintendent's concern that the that the state risks making online education untenable by insisting on rigid monitoring by computer: "If they make electronic schools only get credit for kids' time that they could measure by computer," he argued, "they'll destroy all of the electronic schools because we can't measure it."

Hardy, Lawrence, 2001

Hardy, Lawrence, 2001. *A Question of Funding.* Electronic School. September. http://www. electronic -school. com/2001/09/0901funding.html

Virtual location is proving to be problematic in many cases. This article interviews Western Pennsylvania Cyber Charter School principal Nick Trombetta about the school's financing and the state's role. The 500-student Midland School District and its increasingly popular Western Pennsylvania Cyber Charter School has been attracting hundreds of students from across the state and charging their home districts for the costs of educating them. After the invoices started arriving, more than 60 districts refused to pay, leaving the cyber school with about $900,000 in unpaid bills. The state Department of Education responded by threatening to withhold about $850,000 in state aid from the protesting districts. In April 2001, the Pennsylvania School Board Association filed a lawsuit on behalf of several districts, stating that cyber schools are not lawful charter schools.

Policy related

Pennsylvania School Boards Association, 2001

Pennsylvania School Boards Association, 2001. White Paper on Cyber Schools: Prepared by the office of Governmental and Member Relations, Pennsylvania Schools Boards Association (PSBA). October. <http://www.psba.org/governmental/Cyber_Sch_White.pdf> Accessed 10/11/02.

The PSBA report demonstrates the importance of state-leveled accountability involvement in the virtual school project and the necessity to take caution in supporting the creation of virtual high schools within the charter or home schooling protocol. This study reports the dramatic and costly impact of cyber schools in Pennsylvania, as thousands of former home schoolers and other students enroll in these programs. PSBA herein presents the results of its survey of school districts conducted at the start of the 2001-02 school year. *The data reveal the growth of an unregulated form of education that is causing millions of unbudgeted tax dollars to be extracted from school districts with little state revenue to offset the expense.*

The Association contends that cyber schools violate provisions of the Charter School Law and the compulsory attendance law and that they constitute home schooling outside the scope of the Home School Law. They are seeking to pursue ways of establishing cyber schools away from the charter school format. Their review (2000-2001) of distance education activity around the country revealed that cyber schools generally do not operate as charter schools in other states. Many cyber schools are state-level initiatives. Agreements are one approach to provide for cooperation between cyber schools and the school districts of residence of their students. Some states restrict cyber school participation to those students who had been enrolled in the public schools in the prior year, thereby precluding home schooled and private school students from transferring to those programs. Accountability is a major concern, both in terms of student performance in Internet-based programs as well as of the operation of the cyber programs themselves. They find that:

> . . .states like Florida, West Virginia and Texas, the chief administrator of the statewide cyber program is either a state official or state-appointed director. In Florida, a governor-appointed board of trustees manages FVS. The board is responsible for entering into agreements with distance learning providers, submitting legislative budget requests and administering and maintaining personnel programs. The FVS board of trustees also establishes policies for admission of students, coordinates school district paperwork and submits reports to the Department of Education. Similarly, the West Virginia Virtual School's state-appointed director has the power to contract with providers, review courses, develop policy and recommend fair funding methods. The state commissioner of education in Texas oversees and selects school districts to participate in the electronic courses pilot program. An overwhelming number of states support their statewide cyber schools by providing a generous legislative appropriation – particularly Florida, Kentucky, Arkansas and Michigan. State funding for these programs is well regulated with checks and balances. Under California's SB 740, schools would be required to request a determination of state funding from the State Board of Education for nonclassroom based instruction. Funding would be allocated to a

> charter school on the basis of the average daily attendance of students of nonclassroom based instruction and may be adjusted by the state board. Arkansas's Office of Information Technology must approve state funded distance learning program spending plans before funds are disbursed. Most states require yearly financial and enrollment reports of cyber programs that benefit from state funding (page 32).

According to the Pennsylvania State Board Association, in many ways cyber schools magnify problems that plague the Charter School Law from its enactment; yet they raise distinct new challenges. PSBA presents this report explaining how these issues arose, where matters now stand and what can be done to enact an effective public policy.

Web-Based Education Commission, 2000.

Web-based Education Commission, 2000. The Power of the Internet for learning: Moving from promise to practice. Washington, D. C.: Report of the Web-based Education Commission to the President of the United States.

This is a report of a bi-partisan congressional commission set out to discover how the Internet is transforming education and how it is used to enhance learning opportunities for all learners from PreK to postsecondary colleges and universities and in corporate training. After talking with educators, policymakers, pioneers, researchers and citizens, the commission feels that the promise of the Internet is: a.) To center learning on the learner rather than on the institution; b.) To focus on the strengths of individuals; and c.) To make life-long learning a practical reality.

The commission's findings deemed that allowing the Internet to reach its full potential is a great American opportunity, one that requires immediate mobilization at a national level. By the end of the process, the commission identified key barriers and offered the following recommendations:

- Make powerful new Internet resources, especially broadband access, widely and equitably available and affordable to all learners
- Provide continuous and relevant training and support for educators and administrators at all levels
- Build a new research framework of how people learn in the Internet age
- Develop high-quality online educational content that meets the highest standards of educational excellence
- Revised outdated regulations that impede innovations and replace them with approaches that embrace anytime, anywhere, any pace learning
- Protect online learners and ensure their privacy
- Sustain funding—via traditional and new sources—that is adequate to the challenge at hand. Technology is expensive and Web-based learning is no exception.

In terms of assessment, this study finds that PreK-12 online courses follow the model of traditional education assessment. The courses are certified by the home state or regional accrediting body with jurisdiction in that state. Courses offered across state lines increase the level of difficulty. Assessment requirements, teacher credentialing and the granting of credits have all been areas of individual state policy. This means that an entity that offers e-learning will have to deal with a complex maze of accreditation standards that vary from state to state (p.75). Further research is required to understand and the legal shifts necessary to adjust to this new Web-based reality.

The e-learning agenda—The President and the 107th Congress are beseeched to embrace e-learning as the centerpiece for the educational model of the 21st Century and to seize the opportunity and focus on the ways in which public law needs to be modified to support this vision. The committee calls for support from the various sectors that can make this happen as the law and the national and local educational infrastructure needs to be profoundly transformed. These are listed below:

- Make powerful new Internet resources, especially broadband access, widely and equitably available and affordable to all learners
- We call on state and federal governments to make the extension of broadband access for all learners a central goal of telecommunications policy
- We call upon policymakers at all levels to work with the educational institutions and the private sector to support the continuous growth of educators through the use of technology

- We call upon the federal government to create a comprehensive research, development and innovation framework for learning technology
- We call upon the public and private sectors to join forces in developing high-quality content and applications for online learning
- We call upon the Congress, the US department of Education and state and regional education authorities to remove barriers that block full access to online learning resources, courses and programs while ensuring accountability of taxpayer dollars
- We call upon parents, the education community and the private sector to develop and adopt privacy and protection safeguards to assure that learners of all ages are not exploited while participating in online learning activities
- Finally, we call upon the federal government, states, localities and the private sector to expand funding initiatives and to develop new models to bring these policies to reality (pp. v, vi)

Senate Bill 740

Senate Bill 740 http://info.sen.ca.gov/pub/bill/sen/sb_0701-0750/sb 740 bill 20011014 chaptered. html

This California senate bill was introduced, to amend charter schools governance to make available independent study for students. This bill authorizes any charter school that has an approved charter to receive funding for nonclassroom-based instruction, as defined for that purpose, only if a determination for funding is made by the State Board of Education. The Board was required to adopt regulations before February 1, 2002 to define governance stipulations for nonclassroom-based instruction. The central issues addressed are that:

(1) Equity must be ensured

(2) Districts make provisions for charter schools operating within the district to provide these charter school with facilities equivalent to those in which the students would be accommodated if they were attending other public schools; it also establishes a Charter School Facility Grant Program, administered by the State department of education to provide facilities, rent and lease costs for pupils in charter schools based on pupil

(3) The act also specifies the years in which the superintendent of public instruction is to make apportionments on behalf of charter schools including an amount per unit of regular average daily attendance; the act reserves that the SBOE be allowed to adjust funding amounts on the basis of average daily attendance generated by nonclassroom-based instruction

(4) The act requires that the legislative analyst conduct evaluations including an analysis of the funding system; this act became effective January 1, 2002

Trotter, Andrew, 2001

Trotter, Andrew, 2001. *Cyber schools carving out charter niche.* Education Week 10/24/01 <http://www.eduweek.org/ew/>

Nearly 30 cyber charter schools offer online instructions in over a dozen states and are clearly sending the message to policymakers and educators that the rules for "brick- and -mortar" schools do no longer work in cyberspace. The heart of the issue is whether or not to consider cyber charters the same as home schools and finance them as other regular public education units. Other issues are whether these schools are controlled by aggressive for-profit companies, like Ohio's largest cyber charter that enrolls 2,838 (9th-12th grade) students.

Pros: Schools are free of the burden of spending on buildings; they generally use fewer schools and may receive start money from for-profit companies. According to this article, parents like the "high-achieving curriculum" they receive at no cost.

Cons: The cyber charters are perceived as a threat to the funding system since these schools draw enrollment statewide yet the law allocates monies per district (The article discusses Pennsylvania case where tuitions were refused to be paid by districts for students enrolled in a cyber charter out of their district. Another case cited with similar funding issues is the Texas Virtual Charter School.); the Teacher's Unions have also testified against cyber charter certification processes; another issue brought up by educators is the over reliance on parents for the instruction of these home-based instruction programs.

Educational Technology Coordinating Council Master Plan 2000-2003

State of Texas Master Plan for Educational Technology 2000-2003 http://www.etcc.state.tx.us/inside/master_plan.html

The 76th Legislature's House Bill 1 established the Education Technology Coordinating Council (ETCC or the Council). The Council consists of representatives from the TEA, the Department of Information Resources (DIR), the General Services Commission (GSC), the State Board for Educator Certification (SBEC), the Telecommunications Infrastructure Fund (TIF) Board, the Texas State Library and Archives Commission (TSLAC), the Texas Higher Education Coordinating Board (THECB) and the Colleges of Education. For the purposes of this report, Colleges of Education refers to schools, colleges, or departments of education (SCDE).

The Council is charged with ensuring "the cooperation and coordination of the state's efforts to implement educational technology initiatives," and to develop "a statewide master plan for education technology." The Legislature instructed the Council to pay "particular attention to the coordination of preservice and inservice training for teachers and librarians."

The Council members developed eight goals.

Goal 1: Articulate the vision for and maintain a unified policy direction among Council members to guide the creation and implementation of educational technology initiatives in Texas

Goal 2: Ensure high-quality preservice and professional development to enable educators to effectively and efficiently use technology to improve student learning and administrative processes

Goal 3: Develop the leadership in planning and implementation needed to ensure effective and efficient use of the technologies made available to educators

Goal 4: Coordinate technology-related funding processes among state agencies to provide maximum benefits to schools and teacher preparation institutions and issue grants to maximize a coordinated effort

Goal 5: Help educational institutions understand the resources that are available and the most beneficial ways to use them

Goal 6: Identify and develop profiles and select and disseminate exemplary practices of technology infrastructures within the state

Goal 7: Promote a minimum level of technology access and use in the state's local education agencies and teacher preparation institutions

Goal 8: Promote interoperability of technology resources and processes to derive maximum benefits for state and local investments in technology resources

ETCC RECOMMENDATIONS

The ETCC's goals provide the basis for comprehensive planning of educational technology initiatives and set the direction and tone for coordination and collaboration among state agencies and institutions of higher education in Texas. The recommendations in this report form a statewide plan for collaboratively implementing educational technology. In brief, the Council's recommendations are as follows:

1. Continue the Education Technology Coordinating Council or successor group and include the associated legislative Rider in the bill pattern of each participating agency
2. Continue coordination among the TIF, TEA and TSLAC grant processes
3. Identify E-Rate funding recipients and assist nonparticipants in securing funding
4. Develop a process for the schools and colleges and departments of education (SCDE) to infuse technology within teacher education
5. Develop a process for Colleges of Library Sciences to infuse technology within librarian education
6. Identify models and strategies to provide opportunities for inservice educators to meet the technology proficiency benchmarks as established by SBEC
7. Establish minimum standards for technology sustainability at schools and libraries
8. Determine public education's role in creating a workforce for the digital economy
9. Establish Web-based information resources via a Web portal that enables educators to make effective technology decisions

10. Encourage local leadership, resource development and community involvement for the use of technology in education
11. Develop strategies for implementing and sustaining the goals of the ETCC
12. Adopt the Texas School Technology and Readiness (STaR) Chart as the standard for K-12 and the CEO Forum's Teacher Preparation STaR Chart as the standard for SCDE

Summary of Technology Applications Standards

http://www.edb.utexas.edu/etcc/inside/masterplan/html/tech_app_summary.html

Standard I	All teachers use technology-related terms, concepts, data input strategies and ethical practices to make informed decisions about current technologies and their applications.
Standard II	All teachers identify task requirements, apply search strategies and use current technology to efficiently acquire, analyze and evaluate a variety of electronic information.
Standard III	All teachers use task-appropriate tools to synthesize knowledge, create and modify solutions and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.
Standard IV	All teachers communicate information in different formats and for diverse audiences.
Standard V	All teachers know how to plan, organize, deliver and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills (TEKS) into the curriculum.
Standard VI	The computer science teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications TEKS in computer science, in addition to the content described in Technology Applications standards I-V.
Standard VII	The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications TEKS in desktop publishing, in addition to the content described in Technology Applications standards I-V.
Standard VIII	The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications TEKS in digital graphics/animation, in addition to the content described in Technology Applications standards I-V.
Standard IX	The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications TEKS in multimedia, in addition to the content described in Technology Applications standards I-V.
Standard X	The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications TEKS in video technology, in addition to the content described in Technology Applications standards I-V.
Standard XI	The webmastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications TEKS in webmastering, in addition to the content described in Technology Applications standards I-V.

CORD & Concord Consortium, 2001

CORD and Concord Consortium, 2001 Technology to Improve Texas Education: Recommendations for Policy Consideration and Funding. Report by CORD and The Concord Consortium Sponsored by the AT&T Foundation. Waco, TX: CORD, (May).

Technology to Improve Texas Education presents conclusions of a study designed to inform policy makers to determine how information technology may improve public education in Texas. According to the study, public education faces unprecedented challenges when it comes to fulfilling the task of providing every American student with a high-quality education.

In order to help all students succeed significant steps have been taken such as standards, improved pedagogies, high-stakes assessments and accountability. The process is far from complete. According to this study, reaching this goal demands the commitment of resources needed to put in place a system that provides universal access to the most up-to-date

information and educational tools available— *and the cost of that commitment can be great.* The report argues that information technology offers many educational benefits and yet this study finds that its use in Texas public schools is still *primitive.* Because every adult American must be able to use computers at some level— and the higher the better—many high school curricula include a course or two on computer applications.

Yet access to the tools is still not uniform across the country and the use of information technology in teaching is still in its incipient phases. This report suggests that students are not acquiring the skills they will need to be productive in the 21st century.

This information technology is more than just a subject to be included in any well-rounded academic program, alongside math, science and other subjects. It is also a solution. It provides access to tools that enhance teaching and learning in math, science, language arts and virtually any other subject, including technology.

This report describes how Texas fits into the national picture—the special challenges Texas faces because of size and demographics, the positive steps it has taken and the steps it must take in the future. The stated mission of the Texas education system—to ensure that all Texas children have access to a high-quality education that enables them to achieve their potential and fully participate now and in the future in the social, economic and educational opportunities of our state and nation—represents a world-class challenge. Few states have made such a commitment, backed by statute and directive and upheld by its accountability system.

This paper reports that in the last five years, Texas invested over $500 million in connectivity and access through TIF grants to schools, libraries and health centers. Since 1992, Texas has also invested $100 million a year through the Technology Allotment. In addition, Texas schools are receiving over $150 million each year in federal E-Rate discounts. But, the report emphasizes capacity building, as hardware and wires alone cannot support the goal of world-class education for all. While the required infrastructure is taking shape, the profound change in instructional strategy and content demanded by life in the information age is still ahead.

CORD and Concord Consortium (2001) in Technology to Improve Texas Education highlight that Texas must act now to refine goals and redirect resources, or the opportunity for a brighter future through education will go awry. This report presents specific recommendations and describes the benchmarks and actions associated with the recommendations. The recommendations focus on four areas:

1. Professional development, particularly professional development delivered via the Internet
2. Web-based content and tools
3. Hardware, connectivity and technical support
4. Accountability

The researchers believe that the Texas Legislature should take their recommended actions now. The resulting system will go a long way toward providing high-quality education to all Texas children.[50]

NASBE, 2001

NASBE, 2001. Any time, any place, any path, any pace: taking the lead on e-learning policy. The Report of the NASBE Study Group on e-learning: The Future of Education. Alexandria, VA: National State Boards of Education.

This report emphasizes the transformative power of new and emerging technologies in learning. The NASBE study group's understanding is that e-learning is rapidly transforming many facets of the educational system, how and what students learn, the concept of school, the teacher relationship and, at a systemic level, the educational and pedagogical process.

- E-learning will improve American education and it should be universally implemented as soon as possible.
- Policymakers should seize the lead and assure that the promotion of e-learning spreads rapidly and equitably.

[50] Summarized recommendations and benchmarks have been integrated into Appendix K.

In the face of fast-paced changes and newly emergent needs, the NASBE study group is concerned with creating standards and policy that transforms barriers and supports needed adjustments. Recommendations focused on the following areas:

I. Reengineering the system:

a. Revising standards: revisit what should be stressed in state and district academic standards.
b. Bring state assessment online: develop and implement computer-based assessment systems.
c. Streamlining policy: adopt or revise state and local policies for efficient administration of e-learning and review policies that can result in counterproductive incentives or inhibit e-learning.
d. Empowering families and users: consider the extent to which the public education system should offer and provide choices to families among various ways of organizing and delivering learning services.
e. Adjusting beyond geographic boundaries: determine how best to work through policy issues that cross state boundaries.

II. Assuring equity

a. Ensuring high-quality educators for all children: redouble efforts to establish policies and programs to ensure that well-prepared and well-supported teachers are equitably deployed across all settings so that every student is served by instructional staff who provide effective guidance and assistance.
b. Providing access to robust equipment and the Internet in school: ensure that every student has access at school to the equipment, software, fast Internet connections and other resources necessary to take full advantage of e-learning opportunities.
c. Providing after-school access: work with agencies to ensure that every student has convenient and affordable access to e-learning opportunities when school is out.
d. Supplying technologies to assist students with special needs: establish policies and acquire funding to ensure that all students with special needs (disability, language, setting) effectively gain the benefits of online courses and other instructional resources in ways equivalent to other students.

III. Delivering high-quality instruction to all learners

a. Offering on line courses for-credit: establish policies and procedures to encourage the universal availability of virtual schools and other opportunities for students to earn credit for taking a wide variety of classes online. (The areas of immediate policy attention are course development, administration, finances, enrollment, granting credit, quality assurance and support, p. 43-44).
b. Providing high-quality e-learning courses: Determine the effective ways to rapidly expand the availability of a wide range of high-quality e-learning resources.
c. Protecting children: develop and or revisit policies addressing appropriate student use of Internet, privacy protection and advertising in public schools.

The vision and the opportunity offered to policy- and decision-makers at all levels of the educational spectrum, is that e-learning is a powerful way to expand access for all students to high-quality education. However, these raise complex policy issues.The study group gives priority the above recommendations as facets of policy in need of immediate action.The study group also recognizes that the major costs involve investment in new technologies and in capacity building, e.g., to train support staff and teachers to be creative with these new technologies.

SREB, 2000

SREB, 2000. Principles of Good Practice: The Foundation for Quality of the Electronic Campus of the Southern Regional Education Board 2000-2001, accessed on 10/11/02, http://www.electroniccampus.org/student/srecinfo/publications/principles.asp

The Electronic Campus (EC) of the SREB was designed to help students find and enroll in high-quality courses and programs at colleges and universities in SREB states. Students will be able to complete most of the coursework electronically and may not need to leave their hometowns or campuses. By using the EC, students will be able to obtain information over the Internet about each course and program and will know the standards that the colleges and universities have pledged to meet for these distance learning programs and courses. Students interested in enrolling in a program or course will be able to link easily with the college or university offering it.

The goal of the EC is to provide students with easier access to high-quality programs and courses. An initial survey, *SREB State Regulations as They Apply to Distance Learning,* reported that *"there appear to be no significant regulatory considerations that would halt the development of such a regional approach."* Thus, in January 1998, the EC was launched.

Scope of the Electronic Campus—The scope of the EC is higher education academic degree and certificate programs and credit courses offered electronically, as well as support services for students.

The Principles of Good Practice were developed to assure students about the quality of courses and programs at the EC. The principles are adapted from the Western Interstate Commission for Higher Education (WICHE) and other organizations. All courses and programs to be listed in the EC have been reviewed against the Principles of Good Practice by the offering colleges or universities and have been coordinated through the state higher education agency.

Use of Principles—The purpose of the Principles of Good Practice is to identify the expectations and requirements for participation in the EC. Each institution that seeks to offer an electronically delivered program or course will be asked to ensure that it complies with these principles. The offering institution and the state's designated higher education agency are responsible for quality control. The principles will be used to: guide the development of electronically delivered programs and courses to ensure that characteristics of good teaching and learning are addressed; ensure at the institutional level the high-quality of the program or course that is seeking acceptance by the EC; review the quality of the program or course before it is sent by a state higher education agency for listing by the EC. Several assumptions are central to these principles:

Basic Assumptions

1. The program or course offered electronically is provided by or through an institution that is accredited by a nationally recognized accrediting body and is authorized to operate in the state where the program or course originates.
2. The institution's programs and courses holding specialized accreditation meet the same requirements when offered electronically.
3. The institution may be a single institution or a consortium of institutions.
4. These principles are generally applicable to degree or certificate programs and to courses offered for academic credit.
5. It is the institution's responsibility to review educational programs and courses it provides electronically and to ensure continued compliance with these principles.
6. The appropriate state agencies or organizations in the state where courses or programs are offered will coordinate participation in the EC.
7. Institutions offering programs or for-credit courses are responsible for satisfying all in-state approval and accreditation requirements before students are enrolled.
8. Participating states agree to accept the listing on the EC as assurance that courses and programs meet the Principles of Good Practice.
9. Institutions should give priority for enrolling in EC courses and programs to qualified residents of the SREB region.

SREB, 2002

Southern Regional Education Board. 2002. *Funding Web-based Courses for K-12 Students to Meet State Educational Goals.* Atlanta, GA: SREB.

This report provides initial information to help guide states as policies are developed. It explores goals states may adopt to support Web-based courses, identification of circumstances in which Web-based courses are appropriate and funding and potential cost savings of Web-based courses. The report notes that potential cost savings may rest in the reduction of high school dropouts and improved educational attainment rather than direct cost savings resulting from an alternate delivery system.

West Virginia Board of Education Policy, 2001

http://wvde.state.wv.us/policies/p2450.html

West Virginia Board of Education Policy 2450, Distance Learning and the West Virginia Virtual School, was revised in the fall of 2000 to reflect this legislation.

1.1 Scope—Establishes requirements for distance, online and technology-delivered learning programs, including student needs, course content, teacher/facilitator guidelines, virtual classes, funding and management at the state, county and school levels.
1.2 Authority-West Virginia Constitution, Article XII, ß2; West Virginia Code.

ß18-2-5; ß18-2E-9 This is a revision of Policy 2450.
1.3 Filing Date-September 18, 2000.
1.4 Effective Date-October 18, 2000.

Purpose. The purpose of this policy is to assure consistent high-quality education for the students of West Virginia while utilizing technology-delivered courses. In order for a student to receive credit for a technology-delivered course, he/she must be a student enrolled in a West Virginia public school.

ß126-48-3. Course Approval
3.1 Distance, online or virtual learning courses offered for public school credit shall be approved by the West Virginia Department of Education. In order to register the technology-delivered learning courses for-credit, providers shall submit an online registration form to the West Virginia Department of Education for approval. In order for students to receive distance learning courses for-credit, a county superintendent or designee shall verify that courses and providers are WVDE approved.
3.2 Distance learning courses may be approved when curriculum content cannot be delivered because there is a shortage of certified personnel, a need to provide low-incidence courses, a need to offer a course while the teacher/facilitator renews course-related skills, or any other validated student need to access technology-delivered courses.
3.3 Distance learning course content will be reviewed for correlation with the West Virginia Board of Education instructional goals and objectives (IGOs). Copies of the IGOs and instructional policies may be found on the WVDE web page at http://wvde.state.wv.us
3.4 Providers will adhere to the state and federal privacy regulations regarding students.
3.5 In an alternative education setting, distance learning shall in no case be a student's only source of instruction.

Provisions of State Board Policy 2418: Regulations for Alternative Education Programs for Disruptive Students shall be adhered to including, but not limited to, the provision of behavioral components in addition to academic course work.

ß126-48-4 Management
4.1 Course facilitators located in West Virginia schools may be required to hold specific certification/qualifications based upon provider guidelines that may vary from course to course.
4.2 The distance learning course facilitator shall receive inservice training or technology-delivered instructions pertaining to the course organization, classroom management, technical aspects, monitoring of student testing and securing other student services as needed.
4.3 The county superintendent shall designate a distance learning contact at the school level to ensure virtual class information is provided to students and parents, any necessary affiliation agreements with the course provider are secured, the course facilitator has been identified and completed other duties as necessary to provide student access.
4.4 If a course is to be produced and delivered from within West Virginia, the West Virginia Virtual Course Production </EM>guidelines and procedures must be followed as outlined.

ß126-48-5 Course Materials
5.1 Students who take distance learning courses which are required for graduation shall utilize instructional materials from the West Virginia approved adoption list. Exceptions shall be made based upon instructional materials adoption policy or through the waiver procedure.

5.2 Supplementary materials, as stipulated by the distance learning provider, including specifically designed software and /or printed matter, shall be provided in the distance learning course curriculum to be used for various instructional practices.

ß126-48-6. Evaluation of Pupil Progress

6.1 The local education agency is responsible for establishing specific uniform procedures for evaluating pupil progress and administering a final grade based upon provider guidelines and county policy.

6.2 Evaluations of the success of the virtual program must be documented to provide any continued funding requests.

ß126-48-7 Technology Access

7.1 With the statewide technology installations in public schools, students should have access to virtual courses at school.

7.2 When available, student access may be authorized at other equipped locations such as public libraries, community learning centers and homes.

7.3 The school distance learning coordinator will be responsible for assisting students in finding solutions for access.

ß126-48-8 Funding

8.1 Funding for distance learning courses and associated materials may be provided through the school system instructional budgets or grant awards.

8.2 Parents will be responsible for distance learning costs if the selected course is currently being offered at the school and there is no justifiable reason to duplicate the school course.

ß126-48-9 Procedures

9.1 To accommodate rapidly changing options for virtual classes and distance learning, guidelines and procedures will be developed to review operational issues in a timely manner and will include legislation components.

9.2 Whenever necessary to provide appropriate virtual classes and distance learning, the wavier process will be utilized.

Clark, Tom. 2001

Clark, Tom. 2001. *Virtual Schools: Trends and Issues.* A report commissioned by the Distance Learning Resource Network. http://www.wested.org/cs/wew/view/rs/610.

This report provides a summary and analysis of virtual school activities and trends across the United States. Highlights of the survey include documentation of a trend from virtual high schools to virtual K-12 schools and a per-course price of about $300 per semester. The report notes that Calculus AB was the online AP course offered most often. The report offers recommendations for planners who are considering establishing a virtual school.

Various Aspects of e-learning: e.g., Teachers, Virtual Location, Assessment, Learning Styles, Management, Scale and Scope of Reach

American Federation of Teachers, 2001

American Federation of Teachers, 2001. Teachers' union criticizes approach to distance education. Chronicle for Higher Education Online, August 31, 2001) digest distributed through electronic media listserv http//www.aft.org. higher ed/ issues/technology.html

Educational institutions that implement distance education in a rush are likely to lose their academic integrity. The American Federation of Teachers (AFT) has previously advised against all online undergraduate education. The principal investigator (PI) documents that some institutions take the classroom from the professor and spread it among the technologists that create the online course. However, this is a general situation in higher education environments where 500-student courses are basically taught by teaching assistants. The PI states that the best use of distance education is to support the professor to teach his/her course.

University of Idaho, Distance Education: Research, 2001

University of Idaho, Guide #9 Distance Education: Research, 2001. http://www. uidaho.edu/ evo/ dist9. html# why successful

This guide is one in a series developed by Barry Willis and the University of Idaho Engineering Outreach staff highlighting information from his book, Distance Education - Strategies and Tools and Distance Education - A Practical Guide. Though it is intended as a resource for higher education, many of these aspects are important in the application of all distance education (DE) processes.[51]

Characteristics of Successful Students-Research suggests distant students bring basic characteristics to their learning experience which influence their success in coursework. Distance education students: a.) Are voluntarily seeking further education; b.) Have post-secondary education goals with expectations for higher grades (Schlosser & Anderson, 1994); c:) Are highly motivated and self-disciplined; and d.) Are older.

Studies also conclude that similar factors determine successful learning whether the students are distant or traditional. These factors include:

- Willingness to initiate calls to instructors for assistance
- Possessing a more serious attitude toward the courses
- Employment in a field where career advances can be readily "achieved through academic upgrading in a distance education environment" (Ross & Powell, 1990)
- Previous completion of a college degree (Bernt & Bugbee, 1993)

Characteristics of Successful DE Instruction-Good distance teaching practices are fundamentally identical to good traditional teaching practices and "those factors which influence good instruction may be generally universal across different environments and populations." (Wilkes & Burnham, 1991). Because distance education and its technologies require extensive planning and preparation, distance educators must consider the following in order to improve their effectiveness (Schlosser & Anderson, 1994):

- Extensive preplanning and formative evaluation is necessary. Teachers cannot "wing it". Distance learners value instructors who are well prepared and organized (Egan, et al., 1991).
- Learners benefit significantly from a well-designed syllabus and presentation outlines (Egan, et al., 1991).
- Structured note taking, using tools such as interactive study guides and the use of visuals and graphics as part of the syllabus and presentation outlines contribute to student understanding of the course. However, these visuals must be tailored to the characteristics of the medium and to the characteristics of the students.
- Teachers must be properly trained both in the use of equipment and in those techniques proven effective in the distance education environment. Learners get more from the courses when the instructor seems comfortable with the technology, maintains eye contact with the camera, repeats questions and possesses a sense of humor (Egan, et al., 1991).

The importance of interaction-Many distant learners require support and guidance to make the most of their distance learning experiences (Threlkeld & Brzoska, 1994). This support typically takes the form of some combination of student-instructor and student-student interaction.

Research findings on the need for interaction have produced some important guidelines for instructors organizing courses for distant students:

- Learners value timely feedback regarding course assignments, exams and projects (Egan, et al., 1991).
- Learners benefit significantly from their involvement in small learning groups. These groups provide support and encouragement along with extra feedback on course assignments. Most importantly, the groups foster the feeling that if help is needed it is readily available. Learners are more motivated if they are in frequent contact with the instructor. More structured contact might be utilized as a motivational tool (Coldeway, et al., 1980).

[51] All their guidelines are found in a web page listed in the additional resources appendix.

- Utilization of on-site facilitators who develop a personal rapport with students and who are familiar with equipment and other course materials increases student satisfaction with courses (Burge & Howard, 1990).
- The use of technologies such as fax machines, computers and telephones can also provide learner support and interaction opportunities.

Cost vs. Benefits-When establishing a distance education program, one of the first things considered is the cost of the system. Several cost components factor into the design of a distance education system (Threlkeld & Brzoska, 1994):

- Technology - hardware (e.g., videotape players, cameras) and software (e.g., computer programs)
- Transmission - the ongoing expense of leasing transmission access (e.g.,T1, satellite, microwave)
- Maintenance - repairing and updating equipment
- Infrastructure - the foundational network and telecommunications infrastructure located at the originating and receiving campuses
- Production - technological and personnel support required to develop and adapt teaching materials
- Support - miscellaneous expenses needed to ensure the system works successfully including administrative costs, registration, advising/counseling, local support costs, facilities and overhead costs
- Personnel - to staff all functions previously described

Although the costs of offering distance education courses may be high, there are high costs associated with offering conventional courses. Benefits of distance education courses to the learner include (Ludlow, 1994):

- Accessible training to students in rural areas
- Students may complete their course of study without suffering the loss of salary due to relocation
- Students are exposed to the expertise of the most qualified faculty

Perhaps the question institutions must answer is whether it is part of their mission as educators to offer programs to those who might not be reached without distance education. The primary benefit to educational institutions through distance education may be the increased number of nontraditional students they are able to attract and serve. Research also suggests that as programs become more efficient, program costs should decrease.

Hara and Kling, 2001

Hara, Noriko and Kling, Rob Students' *Distress with a Web-based Distance Education Course: An Ethnographic Study of Participants' Experiences.* CSI (Center for Social Informatics) working paper WP 00-01-B1, Indiana University, http://www.slis.indiana.edu/csi/WP/wp00-01B.html, Accessed 10/11/02.

Communication and shift in technological means requires adjustment both from the instructor as well as the students. This is an ethnographic study revealing the "pains of innovation." From the interviews and observations the authors discovered two foci of students' distress. The first focus was technological problems and students without access to technical support were especially frustrated. The second focus involved the course content and the instructor's practices in managing her communications with students. Students reported confusion, anxiety and frustration when they wanted prompt feedback from the instructor and when they found ambiguous instructions on the Web and in e-mail messages.

> "We have also commented upon the communicative complexity of constructing adequately unambiguous conversations via text-based media. Part of the complexity comes from trying to anticipate the level of detail and phrasing that will be sufficiently helpful to others. But, as our informants also noted, they were also unsure what meta-communicative conventions would be appropriate in their online conversations. E-mail that represents the nodded heads of a face-to-face group could be valued by an instructor to confirm others' understanding, or it could result in yet more e-mail glut. These kinds of practices need to be negotiated within each group. In B3002 and doubtless in many other courses, both face to face as well as online, participants don't explicitly question and negotiate meta-communicative

conventions, even when they are confused and frustrated. These discussions and negotiations require a higher level of social skills on the part of all participants. And their enactment – such as creating strong social presence in a written medium – also requires time and expressive capabilities, which are not well explained in the literatures of online instruction. Clearly, we need more student-centered studies of distance education that are designed to teach us how the appropriate use of technology and pedagogy could make distance education more beneficial for more students. In addition, we need ways to translate the best of such research into the practitioner literature."

Chang and Simpson, 1997

Chang, Ernest and Simpson, Don, 1997. *The Circle of Learning: Individual and Group Processes.* Education Policy Analysis Archives. Vol. 5 (7) February 25. http://epaa.asu.edu/epaa/v5n7/Conclusion Accessed 10/11/02. (staff of Axia Multimedia Corporation)

The importance of the debate this paper engages in has much to do with self-study as an important learning style that the Internet supports. The authors believe that the debate between individual and collaborative learning is based on a false paradigm that the two are on opposite ends of a spectrum. Instead, we have presented a model of individual and group processes in learning that reflect the singularity of the learning process as well as its orientation to the self or the group. From this model, we arrive at four learning categories, representing different mixes of process activity and orientation. They are: Lectures, Self-Study, Concurrent Learning and Collaborative Learning. These learning categories are not mutually exclusive or superior or inferior to one another. Rather, they represent different approaches to individual and group needs and roles, addressing different stages in the integration of information into knowledge for the learner as an individual and s a member of a social group.

In actual learning situations, individuals and groups can and do move between the processes described for each learning category. Specific patterns of these process mixes are evident in a number of examples of typical learning situations. It is our belief that with this understanding, we can view the resource allocation and technology support issues of education and learning not as taking from Peter to pay Paul, but that these learning categories are all essential and inter-dependent. The questions should not be how we replace one by the other, but how we best use them most appropriately, both as strategies and as processes within learning situations and ensure that learners are given the opportunity to benefit from each as needed. A further benefit that we have gained from the model is that it has given us explicit guidelines to follow in the design of new learning products, both in who and what processes are being targeted, as well as what factors must be taken into account for them to be effective. This understanding spans the spectrum of learning systems as they currently exist, to new learning systems as they evolve, catalyzed by developments in communications and information capabilities. These technologies will shift learning approaches and tools in the Circle of Learning and will be integrated in ways which reflect the different processes and needs of students in new learning environments.

Bates, Tony. 2000

Bates, Tony. 2000. Managing Technological Change. San Francisco: Jossey-Bass Publishers http://emedia.netlibrary.com/reader/reader.asp?product_id=26072 e-book accessed 10/11/02.

This book is a study of the main challenges that the implementation of e-learning presents for higher institutions. What follows are Bates findings and recommendations toward supporting the conversion to these educational environments. The most stressed factor is flexibility in teaching and in reorganizational format for adapting and adjusting to these technological changes.

1. New technologies such as the World Wide Web and multimedia have the potential to ***widen access to new learners***, increase flexibility for "traditional" students and improve the quality of teaching by achieving higher levels of learning, such as analysis, synthesis, problem solving and decision making.

2. New technologies are ***unlikely to lead to a reduction in spending*** by higher education institutions, at least in the short term, because of the high and recurrent cost of investment. Still, under the right circumstances new technologies can lead to improved cost-effectiveness by enabling new target groups to be reached and higher quality learning outcomes to be gained at a lower marginal cost per student than through conventional classroom methods. ***To achieve these gains in cost-effectiveness, though, teaching and learning need to be substantially reorganized.***
3. History suggests that the introduction of new technology is usually accompanied by major ***changes in the organization of work***. New technologies are associated with postindustrial forms of organization based on highly skilled and flexible workers with a good degree of autonomy organized into relatively small and flexible operational units.
4. The ***use of technology needs to be embedded within a wider strategy for teaching*** and learning. Teaching departments need to develop concrete, innovative, future-oriented plans for teaching that take account not only of changes in technology but also other changes in society that should influence their work. These departmental teaching plans should influence, be guided by and be integrated into broader institutional plans.
5. ***Appropriate technology infrastructure*** is an essential requirement for technology-based teaching. This means adequate technology support staff for faculty members as well as networks, hardware and software. Furthermore, the technology infrastructure has to serve both administrative and academic needs.
6. There is a tension between the need for students to have access to technology and issues of equity and ***universal access*** to higher education. However, in the long run, it will become economically unsustainable for a university or college to provide all the facilities on campus needed for student access to computers.
7. ***Faculty*** members need much more support and encouragement than has been provided to date for their use of technology for teaching and learning. It is now essential to place greater emphasis on overall teaching ability for appointment, tenure and promotion, even in research universities and the successful use of technology should be one criterion to be considered in assessing teaching performance.
8. ***Cost analysis*** is still not a uniform process because of the diversity in the decisions made about what costs to include or exclude. Is it possible to assess the costs of technology-based teaching reasonably accurately? One significant obstacle to its accurate costing is the *lack of activity-based accounting* procedures in many higher education institutions, in addition to the lack of detailed costing methods for attributing costs to conventional teaching.
9. ***Funding is probably the biggest lever for change***. Various strategies for funding technology-based teaching and learning include external grants, student technology fees and reallocation. Reallocation is the ultimate test of an institution's commitment to teaching with technology. It is difficult to see how an institution can make doing so a primary strategy without some very difficult decisions about reallocation of base operating funds.
10. Partnerships and collaboration are strategies for sharing the costs and leveraging the benefits of technology-based teaching. Several models of partnership and collaboration are described and assessed and the requirements for successful partnerships are identified.
11. An organizational structure encompassing a mix of ***centralized and decentralized strategies*** is recommended ***to support teaching with technology***. The mix will depend to some extent on the size of the organization. Every faculty and large department will need some technical and educational support located in the department or faculty. However, most institutions will also need centralized services with specialist technical equipment and staff with specialist skills who can work with individual faculties and departments.
12. As the institution starts to use technology for teaching outside its local area, new administrative and academic procedures will be necessary in the areas of admissions, finance and academic policy.
13. Given the emerging context of technology-based teaching, especially for traditional campus-based universities and colleges, research and evaluation will be essential. Results from recent cost-benefit research are summarized. The following areas of technology-based teaching ***require further study***: a.) Student access issues; b.) Cost-benefit analysis (especially indirect costs and benefits); c.) The relationship between different technology applications and different learning outcomes; d.) The balance of face-to-face and technology-based teaching and the impact on different kinds of learners; e.) Online tutoring strategies; f.) Educational and technical design of learning materials; g.) Appropriate teaching software; and h.) appropriate management and organizational structures for supporting technology-based learning.

14. The implementation of these strategies will require ***fundamental change*** in the way our higher education institutions are organized and managed. They will affect the nature of the work of faculty members and above all will affect the relationship between teachers and learners.

Bennett Randy E., 2001

Bennett Randy E., 2001. *How the Internet Will Help Large-Scale Assessment Reinvent Itself.* Education Policy Analysis Archives, Vol. 9 (5), February 14. (from Educational Testing Service U.S.A staff). http://epaa.asu.edu/epaa/v9n5.html

The thesis of this article is that the largest facilitating factor that will revolutionize assessment this century is technological, in particular the Internet. In the same way that it is already helping to revolutionize commerce, education and even social interaction, the Internet will help revolutionize the business and substance of large-scale assessment.

The author is convinced that the growth of Internet-based distance learning will have a significant impact upon traditional education. For one, it may threaten the existence of established institutions. Many in the private sector see education as a huge industry that produces mediocre results for a high cost. If the private sector can leverage new technologies, like distance learning, to deliver greater value, the institutions that dominate education today will not be the leaders tomorrow. The rapid growth of for-profit education companies (e.g., the University of Phoenix) and the seemingly endless creation of well-capitalized new ones (e.g., UNext, Caliber, KaplanCollege.com, University Access, K12), suggests that a serious challenge to the existing order is well underway. The gravity of the threat is evident in how nonprofits have responded. Cornell University, Columbia University, the University of Maryland and New York University, among others, have each announced their own for-profit distance learning subsidiaries.

A second reason that the author purports that the growth of Internet-based distance learning will influence traditional education is that regardless of its impact on nonprofit institutions, the distance learning industry will produce sophisticated software that everyone can use; in school and out. Bennet's research suggests that this occurrence will blur the distinctions between distance learning and local education. APEX offers an example http://apex.learning.com/. This company markets online AP courses, targeting districts that want to offer AP but which do not have qualified teachers. Districts can, thus, use APEX offerings on-site.

Efforts like the ones above explain why large-scale assessment in the United States is undergoing enormous pressure to change. That pressure stems from many causes. Depending upon the type of test, the issues precipitating change include an outmoded cognitive-scientific basis for test design; a mismatch with curriculum; the differential performance of population groups; a lack of information to help individuals improve; and inefficiency. These issues provide a strong motivation to reconceptualize both the substance and the business of large-scale assessment. At the same time, advances in technology, measurement and cognitive science are providing the means to make that reconceptualization a reality.

Bennett asks the important question "Are the schools ready?" According to NCES (2000), as of September 1999, 63% of all instructional rooms had Internet access (up from 3% in 1994, a 20-fold increase in five years). The ratio of students to Internet-connected computers was 9:1, down from 12:1 only a year earlier. These are staggering numbers, for they imply that classrooms are connecting to the Internet at a very rapid rate. Smart desks are another likelihood, in which case a test may be electronically delivered, quite literally, to every desktop.

Computer Based Testing (CBT)-In the U.S., then, we may see a future in which every classroom is wired and every student can easily take tests on line. A first generation infrastructure now exists, but it is not yet optimized to produce and deliver tests as efficiently as possible. Right now, there's no question about it: for these programs, assessment by computer costs far more than assessment by paper. If we have learned anything from the history of innovation, it is that new technologies are often initially far too expensive for mass use.

CBT has many of the characteristics of a disruptive technology. Established testing organizations are applying it in their mainstream markets, most notably postsecondary admissions. This innovation was introduced, in good part, to provide competitive edge through features like the ability to take a test at one's convenience and to get score reports immediately. As it turned out, these features overshot the market. At least initially, registrations for continuously-offered computer-based admissions tests mirrored those for fixed-date administrations, suggesting that scheduling convenience was not a highly valued feature in the market of the time. Moreover, examinees were dissatisfied with losing some of the features of paper exams, including the ability to proceed through the test nonlinearly, the option to review the scoring of items actually taken and the low cost.

Richness with reach- the Internet will revolutionize assessment by allowing richness with reach—that is, mass customization on a global scale—as never before. However, as the history of innovation suggests, this reinvention won't come immediately, without significant investment, or without setback. With few exceptions, we are not yet ready for large-scale assessment via the Internet (at least in our schools). However, as suggested above, this story is not so much about today. It really is about tomorrow.

Belanger and Jordan, 2000

Belanger, France and Jordan, Diane, 2000. Evaluation And Implementation Of Distance Learning. London, UK: Idea Publishing Group. http://emedia.netlibrary.com/reader/reader. asp? product_id=42254 e-book, accessed 10/11/02.

This book intends to provide a framework for understanding important theoretical concepts that must be applied when considering distance learning. Distance learning technologies allow instructor and learners:

1. To be separated by physical distance and /or separated in time and where learning may or may not take place simultaneously with other learners
2. To discuss the latest advances in educational technologies, tools and techniques and what infrastructure capabilities are required to support them in the organization
3. To provide a methodology for analyzing and assessing the content and delivery of traditional classroom-based instruction to determine whether, and to what extent, the content can be converted to one or more distance learning technologies

The author offers his research on technologies, tools and procedures in this book as a means to evolve progressively towards a comprehensive distance learning environment:

1. *Technology insertion* where instructional technologies are embedded in the traditional classroom environment
2. *Combined delivery* where part of a course is delivered via the traditional classroom and part of the course is delivered via distance learning tools
3. *Total conversion*, the most extensive, where traditional classroom education and training is entirely converted to one or more distance learning formats

The material presented in this book is appropriate for all of three approaches to distance learning.

(Appendix G offers his evaluation criteria flow chart as an example of the kinds of issues to pay attention when evaluating distance learning technologies.)

Civic.com, 2001

Civic.com, 2001. e-learning aimed at immigrants. (August). Chronicle for Higher Education Online, August 31, 2001) digest distributed through electronic media listserv <http// www. aft. org. higher_ed/ technology>

The University of Wisconsin will provide online courses for migrant families. Migrants move to work in Wisconsin's processing and packing plants and children miss the beginning and the end of a typical school year. The children will be able to study

throughout the year at any school they attend. They will also be provided access at work camps. Food processing firms hope this will enable also the families to learn English and other skills. The program was partially financed through U.S. Education Department grants.

Eisenhower National Clearinghouse, 2001

Eisenhower National Clearinghouse, 2001. Learning Mathematics and science in a virtual high school, <http://enc.org/focus/horizons/document/shtm?input=FOC-002319-index> Accessed 10/11/02.

The Maryland Virtual High school of Science and Mathematics (MVHS) was created in 1994 by teachers who wanted to share their experience from a computational model program. Its goal was to enable science teachers and their students to use computer modeling to solve real-world science problems. It is an environment that relies on teachers, educators, cognitive scientists, scientists and instructional designers. University and community college educators collaborate to extend MVPs activities into courses for inservice teachers. These efforts have been evaluated and show that along with the positive results of formal assessments, teachers find that they are asking questions that require students to analyze more complex situations. The strength of this program is obviously the high-caliber faculty engaged in this project and that it also focuses on teacher developed materials and their affiliation with Educational Foundations and their subscription to the standards for professional development in the *National Science Education standards* (1996).

Rodes et al., 2000

Paul Rodes, Dennis Knapczyk, Carrie Chapman and Haejin Chung, 2000. Involving Teachers in Web-based Professional Development. Indiana Univ. T.H.E. Journal Online: Technological Horizons in Education. May. http://www.thejournal.com/magazine/ vault/A2868D.cfm Accessed 10/11/02.

This article states that it is clear that successful distance education students and teachers are self-selected for their non-passive traits. This article notes that most of the distance education teachers come from scientific backgrounds and provides various techniques to ease noncomputer savvy teachers to teach online. Effective distance education professional development instructional planning must consider the gap between the typical teacher's expectations about the learning process and the capabilities and characteristics of instruction over distance. Careful, gradual introduction of Web-based technologies can guide and enhance learners' transition from a traditional model of pedagogy in which their role is passive, to a model in which they take a full, active role in directing and achieving their own learning.

WICHE 2001

Western Interstate Commission for Higher Education. Technology Costing Methodology (TCM) Project. http://www.wiche.edu/telecom/projects/tcm/index.htm

The Technology Costing Methodology (TCM) is an authoritative costing analysis tool, with standard definitions of cost categories, for use in higher education institutions. Its purpose is to analyze the costs of instructional approaches that make heavy use of technology and to compare cost data for different instructional approaches. TCM is not a cost/benefit analysis and it does not propose a method for determining quality of courses.

Sanford, John. 2002

Sanford, John (2002). High tech teaching could be suicidal. Stanford University Learning Lab, Tomorrow's Professor Listserv message # 391, 2/26. http://www. stanford.edu/dept/news/report/

This article presents an interesting take on the limitations of technology in schools (from the Stanford Report 2/11/02. "University educators largely extol the wonders of teaching through technology. ... skeptics question whether something is lost when ... interaction with students takes place remotely — in cyberspace rather than the real space of the classroom." Sanford also warns against the time spent with e-mail and worries about web pages. Exchange in cyberspace is qualitatively inferior according to Sanford.

Appendix L

Virtual Learning: the State of the Nation

Virtual Learning: The State of the State

Prepared by Gloria McClanahan
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January 2001

Virtual Learning: The State of the Nation

Research at local, district, state, national and international levels identifies the Internet as having the potential to change education from classroom- and teacher-centered to student-focused. The Web-based Education Commission's report, *The Power of the Internet for Learning: Moving from Promise to Practice*, released December 19, 2000, calls upon state governments to

> Revise outdated regulations that impede innovation and replace them with approaches that embrace anytime, anywhere, any pace learning. The regulations that govern much of education today were written for an earlier model in which the teacher is the center of all instruction and all learners are expected to advance at the same rate, despite varying needs or abilities.

(Entire report available at http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=154797)

Alabama, Florida, Georgia, Hawaii, Illinois, Kansas, Kentucky, Missouri, Nebraska, and New Mexico are among the growing number of states that are attempting to do just that. Those states have created state-funded, state-initiated virtual schools currently serving an identified portion of their K-12 population.

The Alabama Online High School (http://altair.pacers.org/AOHS.htm)

Alabama is launching a $10.3 million project that is being tested in five counties. AOHS offers 29 required courses and several electives with all courses approved by the Alabama Department of Education and led by certified teachers. The project, originally intended to share teaching resources among rural schools, will allow students to take courses such as Spanish that would not otherwise be available to them. The project is a joint effort involving the Alabama Department of Education, the governor's office, local school systems, and state education associations.

The Florida Online High School (http://www.flvs.net/)

According to Julie Young, Executive Director of The Florida Online High School, that statewide initiative started at the district level. It will receive $6.2 million next year from the state legislature bringing the total amount of funding for the project to date to $22.2 million. Fifty-six courses were offered for the fall, 2000 semester, all developed in-house. All courses offered by the Florida initiative are dynamic and designed around state and national standards. Development costs for the first set of courses ranged from $50,000 to $150,000 per course. Content is included within the online courses eliminating the need for textbooks in all but one course, calculus, which uses a CD based textbook. Students are screened through guidance counselors and given a brief test to determine whether they are sufficiently motivated to succeed in virtual learning. During the first 28 days of class, a student can drop for any reason. Five thousand students enrolled in the fall semester, 2000. Those 5,000 students represent 10,000 classes completed, meaning that some of the enrolled students took more than one course. All virtual courses are provided at no charge to Florida public school students, home schooled students or students attending for-profit private schools. Young expressed the opinion that the Florida legislature is double funding education for students since the legislature funds the virtual courses as well as the regular school districts. Young said that Florida has collected data indicating that students actually do better learning at home.

All teachers are hired as full-time faculty members by the Florida Online High School. They have 110:1 course loads not including any course development. Teachers who are involved in course development have one semester without students to create a course. The second semester that teacher has 30 to 50 students to pilot and to finish course development. The Florida Online High School does not currently grant diplomas. Home schooled students, who make up 30% of the high school enrollment, want the high school to grant diplomas; public schools do not.

Assessment was originally by proctored examination. However, once the school enrollment exceeded 1,000 students, such exams were logistically difficult. Curriculum is designed to minimize cheating. Students are given three to five different methods of assessment all of which are nontraditional. Choices for the final course exam for economics included a fiscal analysis of a company. Curriculum and exams are developed under the assumption that a parent is sitting next to the student and all exams are open book.

Florida has a 75% completion rate.

Hawaii Electronic Charter School http://echarter.k12.hi.us/

Hawaii E-Charter: New Century Public Charter School provides Hawaii's students with a world class education as they earn credits towards a high school diploma. E-Charter blends Internet-based instruction, multi-media technologies, television, and real time chats to provide standards-based, student-centered learning.

In E-Charter students will be responsible for their own learning, work collaboratively with others, develop higher-level thinking and problem-solving abilities, and produce quality performance and products. All students are eligible to enroll in E-Charter provided they have access to a computer with Internet connectivity and the motivation to complete coursework independently.

Some pages on this site are password protected to ensure the integrity of student records and course content. Public pages include links to sample coursework, course listings, our current newsletters and school personnel contacts.

Kentucky Virtual High School (www.kvhs.org)

Kentucky Virtual High School (www.kvhs.org) functions on a cost recovery basis charging $275.00 per one semester course per student and $500.00 per two-semester course per student. The district pays the fee if that course is not offered locally. If the course is offered within the district but the student prefers to take the virtual course, then the student pays the course fee to the district that then pays the virtual high school. Governor Paul Patton created the Kentucky Virtual High School (KVHS) as a program within the Department of Education in October 1999. KVHS is funded through a special appropriation from the state general fund for the 2000-2002 biennium of $1.5 million, or $750,000 yearly. Currently 500 students are enrolled in 35 different courses; all aligned with Kentucky curriculum standards. Kentucky hopes to avoid development costs by purchasing, licensing, or trading other states for courses already developed. Kentucky employs 20 part-time teachers who are Kentucky certified. No full-time teachers were hired as a result of the initiative.

University of Nebraska-Lincoln's Department of Distance Education, Division of Continuing Studies, Independent Study High School (http://dcs.unl.edu/)

The Department of Distance Education of the University of Nebraska-Lincoln (UNL) received $17.5 million in federal funding to develop an online high school diploma sequence. Beginning in March 1996, the CLASS™ Project was awarded $2.5 million for proof of concept by the General Services Administration. In July 1996, the University of Nebraska-Lincoln's Division of Continuing Studies was notified that it had been awarded a $15 million U.S. Department of Education Star Schools grant. This was a five-year program with first year funding beginning on October 1, 1996.

The CLASS™ (Communications, Learning and Assessment in a Student-centered System) Project (http://class.unl.edu/final_web/index.html) is housed at the University of Nebraska-Lincoln's Department of Distance Education, Division of Continuing Studies, Independent Study High School (ISHS) in Lincoln, Nebraska. According to the information provided on its web site, the Independent Study High School:

- Is accredited by both the North Central Association of Colleges and Schools and the Nebraska Department of Education (NDE). NDE ensures that CLASS™ courses meet national and state standards.
- Currently serves more than 15,000 students annually in 136 countries.
- Offers open enrollment, with students registering throughout the year.
- Has a full-time staff of certificated teachers, academic advisors and a principal.
- Graduated Brittney Spears from its program December 2000.

CLASS™ (http://www.class.com/) is a commercial spin-off from the University of Nebraska-Lincoln Independent Study High School. Class.com, Inc. sells the complete high school diploma program through the university. Class.com also offers course content to individual school districts that can then provide credit for the course from the district. Class.com also offers courses taught by Nebraska certified teachers and courses for which districts may use local teachers. Courses offered by Class.com have been purchased by several Texas independent school districts and education service centers (ESCs).

New Mexico Virtual School (http://sde.state.nm.us)

The New Mexico State Department of Education (SDE) (http://sde.state.nm.us) received $850,000 from the federal government to expand online courses to New Mexico students and $100,000 to support the New Mexico Virtual School. The New Mexico State Department of Education in partnership with the Southwest Secondary Learning Center, Advanced Placement New Mexico, and the Rio Grande Educational Collaborative will provide AP courses online to rural schools and schools located on Indian Reservations and help to implement the New Mexico Virtual School. This virtual, interactive, Web-based learning environment will become active in January 2001. During the spring, summer and fall of 2001, the virtual school will offer full-semester AP courses, college preparatory courses and career technology courses online, in addition to study skills short courses designed to help students become more effective learners. The New Mexico State Department of Education is in the process of planning course enhancements for both middle school and elementary school students.

The Hudson Public Schools Massachusetts (http://vhs.concord.org)

The Hudson Public Schools in Massachusetts is the grantee and fiscal agent of the VHS (Virtual High School) Technology Innovation Challenge Grant. It is responsible for the fiscal and administrative management of VHS. In addition, Hudson oversees the governance structure of VHS. The VHS (Virtual High School) project is a collaborative of high schools from around the country. In exchange for contributing a small amount of teaching time, a school in the collaborative can offer its students NetCourses ranging from advanced academic courses to technical and specialized courses. Schools donate computers, Internet connectivity and staff time. Each school also provides a VHS site coordinator who is responsible for project management and support of teachers and students at their local school. The VHS grant provides training, software, and technical and administrative support. Each school can enroll up to 20 students for each course a teacher contributes. Quality of teaching is maintained by requiring each teacher to successfully complete The Teachers Learning Conference, a graduate-level NetCourse designed to give participants exposure to the best educational strategies and technologies for NetCourse teaching. As the Virtual High School gains popularity, schools can contribute more teachers, enroll more students and help make a wider variety of courses available to the student body. The Concord Consortium plays a technical role in the VHS project. This includes providing technology (servers, software), developing and offering the Teachers Learning Conference (TLC) and assisting teachers in the development of their NetCourses. Concord Consortium is also responsible for the recruitment and selection of additional schools and teachers. Several Texas independent school districts are using courses provided by this initiative.

Other state departments of education are in the process of determining what their roles should be in virtual schooling.

- The Illinois State Board of Education (ISBE) has begun a pilot project, the Illinois Virtual High School (IVHS) to offer advanced placement (AP) and other hard to find courses to students. Its goal is to provide all students the opportunity to take courses that may not be available within their local district. Sixteen courses and 10 AP review courses are being licensed from class.com, Apex Learning, The Florida Online High School and Learningstation.com. While termed a pilot project, the project will continue with technical changes taking place based on the pilot.

- The Maryland State Department of Education (MSDE) is chairing a committee to develop an implementation and funding plan for delivering Web-based courses for high school credit in that state.
- Mississippi is reviewing and approving courses created by corporate providers such as APEX Learning and class.com for high school credit.
- North Carolina Department of Education is evaluating various online models and sponsoring a pilot project at a school district, Cumberland County for the development of a Web Academy.
- The Division of Independent Study, part of the North Dakota Department of Public Instruction, provides distance education for students in Grades 5-12 and is moving toward offering all courses online. Currently one intermediate elementary course, Online Astronomy is offered. Several middle school and high school courses are offered.
- The Oklahoma State Department of Education created a task force, which will recommend new rules to its state board.
- WestVirginia has hadTitle 126 Legislative Rule passed to establish "requirements for distance, online and technology-delivered learning programs, including student needs, course content, teacher/facilitator guidelines, virtual classes, funding and management at the state, county and school levels."

Issues with Virtual Learning

March, 2000, the Center for the Application of Information Technologies at Western Illinois University released a report by Tom Clark entitled *Virtual High Schools: State of the States: A Study of Virtual High School Planning and Operation in the United States.* That report identified characteristics of virtual schools as well as recommendations. Overviews of both the characteristics and recommendations follow.

"Statewide" Virtual High School (SVHS) Characteristics: Summary	
Technology	Experimentation is underway in SVHS systems with several major Web-based learning platforms. Unique state issues related to enrollment capacities sought, in-house technical resources, partnerships, likely teacher and user characteristics, etc. are factors in the choice of development and delivery software. Some seek to provide "one-stop" access to courses offered by a variety of technologies within a statewide educational technology system.
Funding	Most states are combining funding through a state agency with tuition. Barter models are seeking annual fees from affiliated districts, which have a local impact similar to tuition. Alternative funding structures are not readily apparent. Sustainability strategies are a key concern for many systems.
Curriculum	Curriculum offered by SVHs is mainly supplemental to regular instruction, but most will offer alternative diploma options eventually. Wide range of courses available, most not aligned to state or College Board standards. Market demands induce "mission creep" in who is served and why.
Student Services	Student services are handled quite differently in different states. Some place almost all responsibilities on districts, while others have a centralized approach. Some offer virtual library access, online counseling, other virtual services while others arrange in-person services.
Professional Development	Leading schools are taking different approaches, ranging from extensive online training to extensive in-person training, using both in-house and vendor capabilities. No single clear model has emerged.
Access/Equity	Concerns about equitable access to public education are important drivers in most SVHS states. Several have developed policies to encourage SVHS participation by at-risk and rural students.
Assessment	Two largest stand-alone virtual high schools have extensive internal and external assessment structures.
Policy and Administration	Clear agreements and commitments between the various parties involved in administrative services are apparent in most successful models. Some excellent policy examples are freely available from leading models.
Marketing and Public Relations	Major models all have fairly sophisticated approaches to marketing their offerings to potential users, and disseminating information to key stakeholders and opinion leaders.

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Based on an analysis of virtual high school characteristics, "lessons learned," and key drivers of virtual high school development, recommendations are made for those planning "statewide" virtual high school systems. These recommendations are briefly summarized below.

Recommendations for SVHS Planning: Summary	
Technology	Consider all technology options in relation to likely needs over the next two years, and think strategically and flexibly about technology over time. "One-stop" access to a variety of technologies should be considered to maximize return on the state's educational technology investments.
Funding	Consider funding implications early on, including the cost/benefit to local districts for participating, and seek to identify as early as possible the most sustainable funding mechanisms in your state.
Curriculum	In deciding on course licensing and course development parameters, consider the main purpose of your curriculum in terms of state specific needs, and the likelihood of future external course sharing.
Student Services	Form alliances to provide student services, and involve local districts in decisions about the extent of local responsibilities.
Professional Development	Consider a mix of methods for providing teacher training, leveraging existing resources wherever possible, and creating incentives for participation.
Access/Equity	Prioritize the access/equity concerns most relevant to your state and create strategies for reaching at-risk populations and providing AP access.
Assessment	Create an internal formative assessment structure and use external evaluation with reports timed to fit the state legislative cycle.
Policy and Administration	Adopt and adapt from existing virtual HS policies and procedures, while seeking to ensure a good fit with unique state circumstances.
Marketing and Public Relations	Develop a comprehensive marketing strategy, working collaboratively with partners, including enrollment strategies for users, and public relations strategies for stakeholders, funders and opinion leaders, while working to keep their expectations in line with achievable goals.

The full report is available at http://www.cait.org/shared_resource_docs/vhs_files/

Created by educators for educators, the Center for Internet Technology in Education (CiTE) brings together a community of faculty, administrators, and leaders from institutions to address the challenges and opportunities presented by education technologies. Sponsored by eCollege (Nasdaq: ECLG), CiTE is an e-learning consortium among participating institutions to explore current issues related to Internet-based technologies in education. CiTE also provides technical and academic support in the adoption of education technologies in both the online and traditional classroom. CITE sponsored a Virtual High School Symposium 2000, October 17-18, 2000 entitled *Building and Growing Your Online School.* Issues discussed at that conference revolved around the following concepts:

- Is accredited by both the North Central Association of Colleges and Schools and the Nebraska Department of Education (NDE). NDE ensures that CLASS™ courses meet national and state standards.
- Leadership and direction for virtual courses are needed at the state level.
- State needs to correlate virtual courses with end-of-course examinations.
- State needs to evaluate courses to determine whether they are aligned with state standards.
- Virtual course development is too costly (costing from $50,000 to $750,000 per course) and takes too much time for individual districts to do.
- Virtual courses are most needed in areas where there are shortages of teachers (AP, foreign languages, math, science)
- Guidelines for teacher compensation are needed. Should compensation be based on:
    - Amount of course development/supplementation needed?
    - Number of students taking the course?
    - Number of students completing the course?
    - Level of difficulty of the course?
    - Areas of curriculum where there are critical teacher shortages?
- Virtual courses must be offered to students on campus, in computer labs in synchronous mode to ensure that course complies with states' requirements for "seat time."
- Textbooks are incorporated into the content of the virtual course so they are not used or needed. Since states have approval processes for textbooks, should that approval process be applied to the virtual course content?

Southern Regional Education Board (SREB) Educational Technology Cooperative sponsored a Virtual High School Initiative Meeting, December 14, 2000. Issues discussed at that meeting focused around many of the concepts listed above but also some additional concepts listed below.

- Courses developed by corporate providers do not address specific state curriculum standards.
- Corporate providers of virtual courses do not always allow modifying of course content to meet state curriculum standards.
- Courses developed by corporate providers do not have appropriate assessment tools.
- Virtual courses supplant textbooks.
- Goal of virtual courses is a comprehensive, full service high school.
- Counselors need much training on the enrolling and the mentoring of students taking virtual courses.
- Courses developed by one state or virtual school should be shared with other states if copyright issues can be resolved.
- Florida Online High School has collected data indicating that students actually do better in the virtual classroom; that students feel as if they know their teachers more intimately through one-on-one e-mail correspondence than in the traditional face-to-face classroom; that students feel as if they have more hands-on in science laboratory work in the virtual courses than in the traditional science classroom.

- Local districts make decisions about number of courses its students can take virtually.
- Virtual courses used for regular academic semester cannot be used for summer school courses because content must be shortened (watered down) for the briefer summer sessions.
- Curriculum and assessment for virtual courses must be designed to minimize cheating by using performance-based measures, etc. Course credit should be based on mastering content.

Other information prepared by the SREB about virtual learning can be found at http://www.sreb.org/programs/EdTech/edtechindex.asp.

The *Report of the Web-based Education Commission to the President and the Congress of the United States, The Power of the Internet for Learning: Moving from Promise to Practice*, released December 19, 2000, identified the following needs for change to enable the Internet as "one of the most promising opportunities in education ever."

- Powerful new Internet resources, especially broadband access, that are widely and equitably available and affordable for all learners.
- Continuous, relevant training and support for educators and administrators at all levels.
- New research on how people learn in the Internet age.
- High-quality online educational content that is widely available and meets the highest standards of educational excellence.
- Relief from outdated regulations that impede instructional innovation in favor of approaches that embrace anytime, anywhere, any pace learning.
- Safeguards to protect online learners and ensure their privacy, especially that of young children.
- Sustained funding-via traditional and new sources-that is adequate to the challenges at hand.

The full report is available at http://interact.hpcnet.org/webcommission/index.htm.

Virtual Learning: The State of the State

A worldwide, billion-dollar market for content for virtual learning is expanding exponentially. This fact is confirmed through data collected through the Texas Education Agency's Public Education Information Management System (PEIMS) that indicates a 40% increase in Web-based courses completed by Texas students from the 1998-99 to the 1999 – 2000 school year.

	1998 – 1999	1999 - 2000
Number of students enrolled in at least one distance learning course	1,869	2,251
Number of courses (Internet-based or Internet plus an additional technology such as video conferencing) completed by students	247	412

Two levels of virtual or Web-based learning currently exist in Texas. First technologically literate teachers are enhancing everyday classroom teaching and learning by providing Web-enhanced guidance, activities, assignments, resources and assistance in their regular classroom teaching. These Web-enhanced courses are taught in the traditional manner with students in a regular classroom sitting at a specific time for a specified amount of time. However, the instructors for the Web-enhanced courses are using the Internet for supplementary instruction. Some instructors have created web pages that students can access. Others use e-mail or chat rooms for one-on-one assistance to students. These Web-"enhanced" courses are, in many instances, the first steps for teachers' exploring the potential of Web-based learning. The majority of Texas independent school districts have some level of this activity occurring.

In contrast to the Web-enhanced courses are actual Web-based courses with instruction and resources delivered primarily over the Internet. These courses, developed by for-profit companies, by universities and colleges, by Education Service Centers and by independent school districts, may be offered for credit toward graduation to students within the local district or across the state. Courses offered synchronously require simultaneous participation of all students and instructors, or real-time participation of learners and teachers. Videoconferencing, audio conferencing, computer conferencing and/or chats are forms for synchronous delivery. Courses offered asynchronously do not require simultaneous participation of all students and instructors. Students may choose their own instructional timeframe and gather learning materials according to their schedules. Forms of asynchronous communication include e-mail, listservs, and Internet courses. Either synchronous or asynchronous courses may require one or two face-to-face or video conferencing sessions, e-mail or chats, and integration of other technologies such as satellite broadcasts, video conferencing, videotapes and CD-ROMs.

This report focuses on the presence of Web-based courses, rather than Web-enhanced courses, being offered in the state of Texas.

Who has Developed and/or is Offering Web-Based Courses to Texas Students?

Texas Independent School Districts are offering Web-based courses to their students through two methodologies; locally-developed courses and courses developed by corporate providers or for-profit companies.

Districts that develop courses locally use local teachers and technology specialists and ensure that courses are aligned to the Texas Essential Knowledge and Skills. One example of this type of development is Northside ISD. Northside ISD has developed and is offering for the first time in the fall, 2000, a for-credit course, *Web Mastering Online*. This is a two-semester, asynchronous, Web-based interactive class with one face-to-face meeting held in August and one held in January. The course is taught by three Northside teachers who teach this class in lieu of teaching one face-to-face class for Northside. Thirty-five students, selected based on district criteria and abilities to work independently, started the course in August as an addition to their regular class day and full schedule. By December five students had dropped out; the reason given by the majority of students deciding to drop the course was that they did not have time to complete the course in addition to their regular workload.

Northside ISD's web site is accessible at the following URL: http://www.nisd.net/mscmpww/webonline

Other independent school districts in Texas are offering their local students Web-based courses developed and administered by corporate or for-profit companies. One example of this type Web-based activity is in use by Houston ISD. Houston ISD has contracted with Apex Learning to make available to HISD students for free to the student and to students registered with other districts for $395.00 per course. Campuses with students taking the virtual courses pay $395.00 per student for each course for each semester. Courses were first offered during summer, 2000. Thirty-two students enrolled in the AP courses; 29 finished. During the fall, 2000 session, 400 Houston ISD students enrolled in these courses. During the spring, 2001 session 149 students enrolled in these courses. Courses are taught by out of state teachers hired by Apex Learning. Courses are offered synchronously, with students participating from on-campus computer labs, supervised by a Houston ISD professional staff member. The AP courses offered are Calculus AB, Macroeconomics, Microeconomics, Statistics and U.S. Government.

Houston ISD has also developed locally sixth grade Language Arts, Math, Science and Social Studies classes. These classes, too, are offered synchronously with students participating from on-campus computer labs, supervised by a Houston ISD professional staff member.

Houston ISD's web site is accessible at the following URL: http://hs.houstonisd.org/virtualschool/

A large number of independent school districts are researching methodologies for implementing Web-based courses. While Birdville ISD currently offers no Web-based courses, that district is planning to pilot an algebra course over the summer. The intentions of the district were to develop all courses locally and to use local teachers for those courses. However, Lane Ledbetter, Virtual Curriculum Administrator for Birdville ISD, indicated that they were now considering licensing courses because of the cost and time involved in local development. No information about virtual courses is currently available from the Birdville web site.

ESCs are investigating the possibilities of adding Web-based courses for students to their Web-based professional development offerings. ESC Region 4 has announced an initiative that will offer Web-based courses developed and administered by class.com to students across Texas. ESC 4 plans to hire Texas teachers to teach class.com's content. ECS 4 is encouraging other ESCs to participate by paying a subscription fee to ESC 4. Courses will be offered to districts in Texas at $295.00 per student, per semester course. A district may decide to pass the course fee on to their students. Course content is being examined by class.com to determine the degree to which those courses fulfill the Texas Essential Knowledge and Skills

(TEKS). Any course not meeting the TEKS will be enhanced through ESC 4. Pilot projects will be implemented in January 2001, with more robust course offerings available by summer, 2001.

ESC Region 4's Texas virtual School is available at the following URL: http://www.texasvirtualschool.net/

Several other ESCs plan to offer Web-based courses in the near future. No courses are being offered at this time.

Universities are modifying correspondence courses, offering existing Web-based courses for dual-credit, as well as hiring Texas classroom teachers to develop new courses to meet the Texas demand for Web-based courses. The University of Texas High School Diploma Program, part of The University of Texas' High School Distance Learning Center, offers courses that could result in a high school diploma granted by the University. While no courses are Web-based at this time, the University anticipates all high school courses to be completely Web-based by fall, 2001.

University of Texas at Austin's Distance Education Center is available at: http://www.utexas.edu/cee/dec/uths/index.html

Community Colleges offer a selection of Web-based courses to independent school districts for dual-credit/concurrent enrollment. Districts may contract with their local community college. If needed courses are offered at a remote community college, then districts may contract through the Virtual College of Texas (VCT), a collaborative of Texas' fifty community college districts and the Texas State Technical College System. Through the VCT, independent school districts may offer courses for dual-credit/concurrent enrollment from colleges anywhere in Texas. Direct dialog among districts and community colleges is required to address special issues related to secondary-postsecondary collaborations. It is the responsibility of the district to review the curriculum to assure that it satisfies TEKS requirements. Because high school semesters often start before college semesters, special issues may also result from mismatched calendars.

The Virtual College of Texas is available at: http://www.vct.org/

State Agencies

On December 4, 2000, Texas Comptroller Carole Keeton Rylander announced that four Texas school districts, Paris, Plainview, Pharr-San Juan-Alamo and Donna, were chosen to participate in an Internet pilot project. The Comptroller's office coordinated the program with the help of The University of Texas' High School Distance Learning Center, the Texas Association for the Gifted and Talented, IBM and Cisco Systems. The Comptroller's pilot project will offer a Web-based U.S. Government course to gifted and talented high school juniors who apply and are selected to participate. The students will have access to the course 24 hours a day, seven days a week through their school and home computers and laptops donated for the project by IBM. The course curriculum will include videoconferences, a live chat room and an electronic bulletin board. Guest speakers and interactive presentations from state leaders also may be included. Students will be required to complete lessons online that will be supplemented with a textbook.

The news release for this initiative is available at: http://www.cpa.state.tx.us/news/01201gt.html

Corporate Providers of Course Content

Corporate providers or for-profit companies of Web-based courses are offering, and our independent school districts are purchasing, courses developed and taught by teachers certified in states other than Texas. The number of providers is increasing daily. Currently the following corporate providers are the most active:

BeyondBooks (http://www.beyondbooks.com/index.htm) an Internet-based source of educational information that parallels, expands on and deepens current and approved curricula for high schools and middle schools. Beyond Books provides an advertising-free, content rich, course-relevant resource for teachers and students.

Class.com (http://www.class.com) is the commercial spin-off of University of Nebraska - Lincoln (UNL) CLASS program marketing University of Nebraska courses aligned to Nebraska curriculum guidelines. Education Service Center Region 4 has recently signed an agreement with them to offer courses on a pilot basis in January, 2001 with a more robust offering by summer, 2001.

Concord Virtual High School - Concord Consortium (http://vhs.concord.org), now in the 4th year of funding through a 5-year, $7.5 million U.S. Department of Education Technology Innovation Challenge Grant, is selling its content to Texas districts (Socorro ISD, McKinney ISD). Concord Virtual High School is a collaborative, in which participating schools receive 20 student enrollment slots for each teacher they provide to the program.

Apex Learning (http://www.apexlearning.com/) offers AP courses for high achieving students. Founded in 1997 by Paul Allen, co-founder of Microsoft, Apex Learning offers complete curriculum, online teacher support, assessment and reporting.

Academic Systems http://www.academic.com/ provides higher education level courses specializing in interactive math and writing. Academic Systems is the higher education subsidiary of Light Span Partnership Inc. and is currently working with California College Prep Initiative and others to move from supplemental AP materials to full online courses.

ScholarsFirst http://www.scholarsfirst.com/. has assembled leaders in their respective fields to lecture in survey courses taught at an introductory college or honors high school level delivered over the Internet via streaming video with various interactive links. The ScholarsFirst lectures are provided on demand over the Internet via streaming video. This medium allows students to view the material, pause the lectures, link to various related sites, original documents, etc. and access interactive questions and answers. Lectures will be augmented by live discussion sessions via Web-based video technology, chat rooms, message boards, and interactive practice quizzes and tests. The format allows schools to augment lectures with live video teaching sessions with outside teachers if they do not have the capability in-house or wish to augment in-house capabilities. These teachers can be from within the district or from ScholarsFirst staff of TA's. Alternatively if in-house teaching capability is sufficient within the school these sessions are not needed.

Classes are currently in beta sites and are expecting a broad release this spring.

Corporate Providers of Course Shells

eCollege http://www.ecollege.com/

eClassroom, a division of eCollege.com, provides the technology infrastructure (online school and online teaching platform) and technical and academic support services (hosting, 24x7 Help Desk, Instructional Design) necessary to build and operate virtual schools. eClassroom has built statewide virtual high schools for the state departments of education in Kentucky (www.kvhs.org) and Illinois, as well as district virtual high schools in Alaska, Wisconsin, and Georgia. In addition to these services, eClassroom can work with teachers or curriculum committees to build state-specific online courses that meet all state standards. Plus, eClassroom is forging partnerships with many content providers to offer content through the eClassroom system.

Blackboard.com http://blackboard.com/

Blackboard's technology powers online education and related commerce in the academic marketplace of schools, colleges and universities, as well as the organizations that serve them, such as publishers, test prep companies and other education service providers. Blackboard software products and web services reach more than 6,500 institutions in each of the 50 states and in more than 70 countries.

Learning Space http://www.lotus.com/home.nsf/welcome/learnspace

Learning Space 4.0 is an open, Web-based e-learning solution. It's a complete learning management and delivery system that lets you seamlessly integrate your course content, whether you create it yourself or purchase it from leading providers.

What audiences are targeted through Web-based learning?

- Students in districts that do not offer desired courses
- Advanced (mature) students
- Students who travel for professional reasons
- Students taking AP courses
- Students seeking specialized courses not offered locally
- Students seeking to graduate early
- Rural/remote students
- Students eager to learn collaboratively and electronically
- Home-schooled and home-bound students
- At-risk students

What courses are being developed/offered?

- Advanced Placement
- Dual-credit
- Curriculum areas with shortages of certified teachers
- All curriculum areas

What are the issues of virtual courses specifically related to TEXAS?
What state policy issues are generating questions from entities attempting to establish virtual courses in Texas?

- Attendance and funding structure
- Teacher preparation, certification and evaluation procedures
- Instructional materials content approval and funding processes
- Student evaluation procedures
- Accountability

74.23. Correspondence Courses and Distance Learning

Credit toward state graduation requirements may be granted under this section only under the following conditions.

1) The institution offering correspondence courses must be the University of Texas at Austin, Texas Tech University, or another public institution of higher education approved by the commissioner of education.

2) Students may earn course credit through distance learning technologies, such as, but not limited to satellite, Internet, two-way videoconferencing, and instructional television.
3) The correspondence and distance learning courses must include the essential knowledge and skills as specified in Chapter 74.1 of this title (relating to Essential Knowledge and Skills) for such a course.

Questions generated by the above policy include:

- What is the definition of a correspondence course?
- If e-mail or chat rooms are included with a text-based courses, does that mean it is "distance learning" and those course would then fall under 2) rather than 1)?
- Correspondence courses offered by multiple universities and community colleges are being rewritten to be Web-enabled. Are those acceptable for credit as indicated by 2) above because they are distance learning?
- Or does 1) apply and only courses through UT or Texas Tech are acceptable?
- Can other higher ed institutions seek approval from the commissioner?
- Does each district need to evaluate distance learning courses to determine whether that course is aligned to the TEKS?
- Is there some way that this could be done one time at a state level?

ADA

Average Daily Attendance (ADA), can be an issue depending on how distance learning is handled by a district. ADA guidelines (Texas Administrative Code, Title 19, Part II, Subchapter B 129.21) exclude students who may be registered with a district but, because of participation in virtual learning situations, are not enrolled for four hours or are not present during hours that attendance is taken.

Administrators are questioning whether PEIMS will accept data that indicates one teacher is the teacher of record in multiple districts across the state.

Districts can limit the number of either correspondence or distance learning courses a student may take for credit each year.

Teacher issues

- Must Texas students be taught by Texas certified teachers?
- If so, what impact does that have on corporate providers such as Apex Learning that sell their courses to Texas districts and that use out-of-state teachers to teach them?
- How should teachers be compensated for teaching virtual courses? What differentiation must be made for teachers who develop and teach courses and for teachers who teach courses developed by other sources?
- How will teachers be evaluated? Will the professional development and appraisal system (PDAS) still be an appropriate tool? How will out of state teachers be evaluated?

Security issues:

- What assurances can be made that the student enrolled in the course is the student completing the coursework?

Textbook issues:

- Courses developed by corporate providers often contain all content within the course eliminating the need for a hard-copy textbook. What implications does this fact have for Texas' textbook adoption procedure? Should those courses go through the textbook adoption process?

The Texas School Alliance, the Texas Computer Education Association, Northside ISD, and Ysleta ISD have discussed with Jack Elrod, Sally Gary and Richard Powell the need for a state-directed pilot project testing concepts and issues surrounding Web-based courses offered to Texas students. Both Elrod and Powell encouraged those groups to continue in that direction aiming at specific populations such as students taking AP courses. Ellen Williams, legal counsel for the Texas School Alliance has started the development of such a plan.

Questions developed for use for sessions with Florida's, Kentucky's, and Massachusetts' online schools are as follows:

QUESTIONS

ORGANIZATION

1. How is your virtual school organized and structured?
2. Is it a degree granting institution? If yes, how are you integrated with traditional schooling?
3. What are your student attendance measures? How are they calculated?
4. What monitoring activities are in place for tracking student participation?
5. What were some of the main issues addressed during your implementation phase?
6. What do you wish you had thought of or done during the implementation phase that you overlooked?
7. How do you evaluate the success of your virtual school?
8. Do you rely on commercially developed content or do you develop your own curricula?
9. If you use commercial content providers, what process do you go through for your selection process?
10. What process, procedures, or systems did not work for your virtual school?
11. Does your curriculum provide lab science courses? How do you address lab experiences?
12. Do you use multiple technologies for course delivery, i.e. Internet, videoconferencing?
13. How do you market your virtual school?
14. What partnering groups have you formed? Content providers? State agencies? ESCs? Private/Public institutions?
15. How do you verify identity, residence, and participation for audit purposes?

FUNDING

1. Is your virtual school supported by state funding or staffing?
2. What is the basis for funding from the state?
3. Are expenditure requirements attached to funding amounts?
4. What are your refund policies?
5. Is the funding different for distance courses than for traditional classroom courses?

PERSONNEL

1. Is faculty full-time, part-time, contract, or other employees of the virtual school?
2. How do you recruit/pay faculty?
3. How does your organization address professional development for your faculty?
4. How do you address technical and administrative support for teachers/students?

STUDENTS

1. Do students study/work at home, during a study/lab period at a school campus, or some hybrid method?
2. Have you experienced student discipline problems? How were these handled?
3. Are students provided counseling services to help them decide if distance learning is appropriate for them?
4. Are your students allowed open-entry/open-exit or do they start/finish as cohorts?
5. What type of student services do you provide—registration, counseling, e-library, etc?
6. Does your virtual school support home school students?
7. Can students register directly with your school, or do they register through a campus/district?
8. How do you address student assessment?
9. What is your student retention rate? Student grade distributions compared with traditional students?

Compliance Statement

TITLE VI, CIVIL RIGHTS ACT OF 1964; THE MODIFIED COURT ORDER, CIVIL ACTION 5281, FEDERAL DISTRICT COURT, EASTERN DISTRICT OF TEXAS, TYLER DIVISION

Reviews of local education agencies pertaining to compliance with Title VI Civil Rights Act of 1964 and with specific requirements of the Modified Court Order, Civil Action No. 5281, Federal District Court, Eastern District of Texas, Tyler Division are conducted periodically by staff representatives of the Texas Education Agency. These reviews cover at least the following policies and practices:

(1) acceptance policies on student transfers from other school districts;

(2) operation of school bus routes or runs on a nonsegregated basis;

(3) nondiscrimination in extracurricular activities and the use of school facilities;

(4) nondiscriminatory practices in the hiring, assigning, promoting, paying, demoting, reassigning, or dismissing of faculty and staff members who work with children;

(5) enrollment and assignment of students without discrimination on the basis of race, color, or national origin;

(6) nondiscriminatory practices relating to the use of a student's first language; and

(7) evidence of published procedures for hearing complaints and grievances.

In addition to conducting reviews, the Texas Education Agency staff representatives check complaints of discrimination made by a citizen or citizens residing in a school district where it is alleged discriminatory practices have occurred or are occurring.

Where a violation of Title VI of the Civil Rights Act is found, the findings are reported to the Office for Civil Rights, U.S. Department of Education.

If there is a direct violation of the Court Order in Civil Action No. 5281 that cannot be cleared through negotiation, the sanctions required by the Court Order are applied.

TITLE VII, CIVIL RIGHTS ACT OF 1964 AS AMENDED BY THE EQUAL EMPLOYMENT OPPORTUNITY ACT OF 1972; EXECUTIVE ORDERS 11246 AND 11375; EQUAL PAY ACT OF 1964; TITLE IX, EDUCATION AMENDMENTS; REHABILITATION ACT OF 1973 AS AMENDED; 1974 AMENDMENTS TO THE WAGE-HOUR LAW EXPANDING THE AGE DISCRIMINATION IN EMPLOYMENT ACT OF 1967; VIETNAM ERA VETERANS READJUSTMENT ASSISTANCE ACT OF 1972 AS AMENDED; IMMIGRATION REFORM AND CONTROL ACT OF 1986; AMERICANS WITH DISABILITIES ACT OF 1990; AND THE CIVIL RIGHTS ACT OF 1991.

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